

**THE BOOK WAS
DRENCHED**

UNIVERSAL
LIBRARY

OU_168300

UNIVERSAL
LIBRARY

BIBLIOGRAPHY OF RESEARCH ON HEAVY HYDROGEN COMPOUNDS

This volume is a collection of references—about 2000 in number—to published literature on the subject of the heavy hydrogen isotope. The material is classified according to subject in such a manner that previous work in the field may be readily found. The volume should prove useful to anyone concerned with research on isotopes and their application to specific problems.

From the volume preface:

“A bibliography of such research should be welcomed by any worker involved with isotopes. To those familiar with the field it will serve as a reminder of what has been done and suggest new experiments that should be done. To the beginner in isotope research, whether it be with stable or radioactive nuclear species, no better survey of past accomplishments can be supplied. The ingenuity, industry, and achievements of the thousands of investigators, representing every country where scientific research is pursued, have made this bibliography possible. The many unsolved problems that might be studied by isotopic methods can be pursued only if we have a secure knowledge of the attainments of the past.”

George M. Murphy
New York University
Division Editor
Special Separations Project

NATIONAL NUCLEAR ENERGY SERIES
Manhattan Project Technical Section

Division III—Volume 4 C

BIBLIOGRAPHY OF RESEARCH ON
HEAVY HYDROGEN COMPOUNDS

BIBLIOGRAPHY OF RESEARCH ON HEAVY HYDROGEN COMPOUNDS

Compiled by

ALICE H. KIMBALL

Formerly at S.A.M. Laboratories, Columbia University

Edited by

HAROLD C. UREY

Institute for Nuclear Studies, University of Chicago;
formerly at S.A.M. Laboratories, Columbia University

and

ISIDOR KIRSHENBAUM

Esso Laboratories, Standard Oil Development Company;
formerly at S.A.M. Laboratories, Columbia University

First Edition

New York · Toronto · London

McGRAW-HILL BOOK COMPANY, INC.

1949

**BIBLIOGRAPHY OF RESEARCH ON
HEAVY HYDROGEN COMPOUNDS**

Copyright, 1949, by the
McGraw-Hill Book Company, Inc.

Printed in the United States of America

Copyright assigned, 1949, to the General Manager
of the United States Atomic Energy Commission.
All rights reserved. This book, or parts thereof,
may not be reproduced in any form without per-
mission of the Atomic Energy Commission.

Lithoprinted
by
Edwards Brothers, Incorporated
Ann Arbor, Michigan

FOREWORD

The United States program of development of atomic energy has been described by Major General L. R. Groves, who, as Commanding General of the War Department's Manhattan Project, directed the program from mid-1942 until December 31, 1946, as "a generation of scientific development compressed into three years." The tremendous scope of the Manhattan Project Technical Section of the National Nuclear Energy Series, which has been in preparation since 1944, is a tribute to the unprecedented accomplishments of science, industry, government, labor, and the Army and Navy working together as a team. These volumes can be a firm foundation for the United States atomic energy program which, in the words of the Atomic Energy Act of 1946, is " . . . directed toward improving the public welfare, increasing the standard of living, strengthening free competition in private enterprise, and promoting world peace."

David E. Lilienthal, Chairman
U. S. Atomic Energy Commission

ACKNOWLEDGMENT

The Manhattan Project Technical Section of the National Nuclear Energy Series embodies results of work done in the nation's wartime atomic energy program by numerous contractors, including Columbia University. The arrangements for publication of the series volumes were effected by Columbia University, under a contract with the United States Atomic Energy Commission. The Commission, for itself and for the other contractors who contributed to this series, wishes to record here its appreciation of this service of Columbia University in support of the national nuclear energy program.

PREFACE

This volume is one of a series which has been prepared as a record of the research work done under the Manhattan Project and the Atomic Energy Commission. The name Manhattan Project was assigned by the Corps of Engineers, War Department, to the far-flung scientific and engineering activities which had as their objective the utilization of atomic energy for military purposes. In the attainment of this objective, there were many developments in scientific and technical fields which are of general interest. The National Nuclear Energy Series (Manhattan Project Technical Section) is a record of these scientific and technical contributions, as well as of the developments in these fields which are being sponsored by the Atomic Energy Commission.

The declassified portion of the National Nuclear Energy Series, when completed, is expected to consist of some 60 volumes. These will be grouped into eight divisions, as follows:

- Division I — Electromagnetic Separation Project
- Division II — Gaseous Diffusion Project
- Division III — Special Separations Project
- Division IV — Plutonium Project
- Division V — Los Alamos Project
- Division VI — University of Rochester Project
- Division VII — Materials Procurement Project
- Division VIII — Manhattan Project

Soon after the close of the war the Manhattan Project was able to give its attention to the preparation of a complete record of the research work accomplished under Project contracts. Writing programs were authorized at all laboratories, with the object of obtaining complete coverage of Project results. Each major installation was requested to designate one or more representatives to make up a committee, which was first called the Manhattan Project Editorial Advisory Board, and later, after the sponsorship of the Series was assumed by the Atomic Energy Commission, the Project Editorial Advisory Board. This group made plans to coordinate the writing programs at all the installations, and acted as an advisory group in all matters affecting the Project-wide writing program. Its last meeting was held on Feb. 9, 1948, when it recommended the publisher for the Series.

The names of the Board members and of the installations which they represented are given below.

Atomic Energy Commission Public and Technical Information Service	Alberto F. Thompson
Technical Information Branch, Oak Ridge Extension	Brewer F. Boardman
Office of New York Operations	Charles Slessor, J. H. Hayner, W. M. Hearon *
Brookhaven National Laboratory	Richard W. Dodson
Carbide & Carbon Chemicals Corporation (K-25)	R. B. Korsmeyer, W. L. Harwell, D. E. Hull, Ezra Staple
Carbide & Carbon Chemicals Corporation (Y-12) †	Russell Baldock
Clinton Laboratories ‡	J. R. Coe
General Electric Company, Hanford	T. W. Hauff
General Electric Company, Knolls Atomic Power Laboratory	John P. Howe
Kellex Corporation	John F. Hogerton, Jerome Simson, M. Benedict
Los Alamos	R. R. Davis, Ralph Carlisle Smith
National Bureau of Standards	C. J. Rodden
Plutonium Project Argonne National Laboratory	R. S. Mulliken, H. D. Young
Iowa State College	F. H. Spedding
Medical Group	R. E. Zirkle
SAM Laboratories §	G. M. Murphy
Stone & Webster Engineering Corporation	B. W. Whitehurst
University of California	R. K. Wakerling, A. Guthrie
University of Rochester	D. R. Charles, M. J. Wantman

* Represented Madison Square Area of the Manhattan District.

† The Y-12 plant at Oak Ridge was operated by Tennessee Eastman Corporation until May 4, 1947, at which time operations were taken over by Carbide & Carbon Chemicals Corporation.

‡ Clinton Laboratories was the former name of the Oak Ridge National Laboratory.

§ SAM (Substitute Alloy Materials) was the code name for the laboratories operated by Columbia University in New York under the direction of Dr. H. C. Urey, where much of the experimental work on isotope separation was done. On Feb. 1, 1945, the administration of these laboratories became the responsibility of Carbide & Carbon Chemicals Corporation. Research in progress there was transferred to the K-25 plant at Oak Ridge in June, 1946, and the New York laboratories were then closed.

Many difficulties were encountered in preparing a unified account of Atomic Energy Project work. For example, the Project Editorial Advisory Board was the first committee ever organized with representatives from every major installation of the Atomic Energy Project. Compartmentation for security was so rigorous during the war that it had been considered necessary to allow a certain amount of duplication of effort rather than to permit unrestricted circulation of research information between certain installations. As a result, the writing programs of different installations inevitably overlap markedly in many scientific fields. The Editorial Advisory Board has exerted itself to reduce duplication in so far as possible and to eliminate discrepancies in factual data included in the volumes of the NNES. In particular, unified Project-wide volumes have been prepared on Uranium Chemistry and on the Analysis of Project Materials. Nevertheless, the reader will find many instances of differences in results or conclusions on similar subject matter prepared by different authors. This has not seemed wholly undesirable for several reasons. First of all, such divergencies are not unnatural and stimulate investigation. Second, promptness of publication has seemed more important than the removal of all discrepancies. Finally, many Project scientists completed their contributions some time ago and have become engrossed in other activities so that their time has not been available for a detailed review of their work in relation to similar work done at other installations.

The completion of the various individual volumes of the Series has also been beset with difficulties. Many of the key authors and editors have had important responsibilities in planning the future of atomic energy research. Under these circumstances, the completion of this technical series has been delayed longer than its editors wished. The volumes are being released in their present form in the interest of presenting the material as promptly as possible to those who can make use of it.

The Editorial Advisory Board

COLUMBIA UNIVERSITY PROJECT FOREWORD

Government-supported research on nuclear energy first occurred in early 1940 when certain funds made available by the Army, Navy, and National Bureau of Standards were used for experiments at Columbia University. The subsequent history of this project as it expanded in many other universities and industrial laboratories is told in detail in the Smyth Report. Two of the major programs began at Columbia University: the uranium-graphite pile reactor and the gaseous diffusion method of uranium 235 separation.

Lack of sufficient laboratory space at Columbia for the development of both programs led to the transfer in the spring of 1942 of the uranium-graphite reactor program to the University of Chicago. The program of separation of uranium 235 by gaseous diffusion, and various ancillary projects, developed rapidly until not only all available space in the Columbia University buildings was occupied but, in addition, an even greater amount of rented space.

The project for the separation of uranium isotopes by gaseous diffusion was first carried forward through various government contracts under the direction of Harold C. Urey, Professor of Chemistry, and John R. Dunning, Assistant Professor of Physics. In 1943 the work was unified under a single contract with the Manhattan Engineer District with Professor Urey as Director. An account of the research on the major assignment, the separation of the uranium isotopes, is to be found elsewhere in the National Nuclear Energy Series. The volumes that this preface introduces deal with the general mathematical theory of isotope separation, with some new experimental methods of separating isotopes, with spectroscopic properties of uranium compounds, and with the chemical and physical properties of heavy water and other deuterium compounds. Most of this work was done at Columbia, but parts of it were carried on at the National Bureau of Standards and at The Johns Hopkins University.

George B. Pegram
Chairman, Columbia University Division
of War Research, 1941-1945

VOLUME PREFACE

The heavy hydrogen isotope, deuterium, is the most generally useful tracer atom now known because of the ease with which it may be concentrated and analyzed in comparison with other isotopes. From the time of its discovery in 1931 it has been the subject of a very large number of papers dealing with its properties and those of its compounds, it has been used to test numerous theories where mass effects were suspected, and it has proved to be valuable as a tracer in chemical and biological reactions.

A bibliography of such research should be welcomed by any worker involved with isotopes. To those familiar with the field it will serve as a reminder of what has been done and suggest new experiments that should be done. To the beginner in isotope research, whether it be with stable or radioactive nuclear species, no better survey of past accomplishments can be supplied. The ingenuity, industry, and achievements of the thousands of investigators, representing every country where scientific research is pursued, have made this bibliography possible. The many unsolved problems that might be studied by isotopic methods can be pursued only if we have a secure knowledge of the attainments of the past.

George M. Murphy
Editor-in-Chief, Division III
National Nuclear Energy Series

CONTENTS

	Page
Foreword	v
Preface	vii
Columbia University Project Foreword	xi
Volume Preface	xiii
 Introduction	 1
Alphabetical Listing by Author	5
Subject Index	277
Compound Index	291

The Manhattan Project Technical Section of the National Nuclear Energy Series is intended to be a comprehensive account of the scientific and technical achievements of the United States program for the development of atomic energy. It is not intended to be a detailed documentary record of the making of any inventions that happen to be mentioned in it. Therefore, the dates used in the Series should be regarded as a general temporal frame of reference, rather than as establishing dates of conception of inventions, of their reduction to practice, or of occasions of first use. While a reasonable effort has been made to assign credit fairly in the NNES volumes, this may, in many cases, be given to a group identified by the name of its leader rather than to an individual who was an actual inventor.

INTRODUCTION

The following bibliography of research on heavy hydrogen and its compounds is arranged alphabetically according to the name of the senior author of each work. The papers by a given author or group of authors are arranged in chronological order in so far as ascertainable. Names that are spelled in more than one way are cross-indexed, as are also coauthors.

Every attempt has been made to obtain a complete record of papers on the subject, but work on nuclear reactions has not been included unless other data of interest are reported. Approximately 80 per cent of the listings were obtained from Chemical Abstracts (January 1932 through December 1945), and the Chemical Abstracts reference has been included in the bibliography wherever possible. Most of the remaining references were derived from a bibliography compiled by George M. Murphy directly from the published literature between 1932 and 1936. Review papers are so described.

In order to make the bibliography more generally useful for those interested in a particular type of isotopic research or a special deuterated compound, both a Subject Index and a Compound Index have been supplied. These two indexes when used together should present a comprehensive picture of the content of each paper.

It will be noted that each entry in the bibliography is identified by a letter-number symbol and one or more other code letters designating a particular topic in the subject index. The key to this index is as follows:

Ab	ABUNDANCE OF DEUTERIUM
AbG	Geological (Including Petroleum)
AbO	Organic
Ad	ADSORPTION AND SORPTION
AdG	Gases on Solids
AdL	Liquid on Solids

An ANALYTICAL METHODS

- AnDn Density Methods
- AnEl Optical Rotation
- AnMg Magneto optic Methods
- AnMs Mass Spectrograph
- AnRf Refractive Index
- AnTh Thermal Conduction

Bi BIOLOGICAL EFFECTS OF HEAVY WATER

- BiB Botanical
- BiC Biochemical
- BiZ Zoological

Cr CRYSTAL STRUCTURE

- CrX X-ray Diffraction

Ec ELECTROCHEMICAL PROPERTIES

- EcC Conductivities and Mobilities
- EcO Overvoltage
- EcP Electrode Potentials

Ed ELECTRON DIFFRACTION**El ELECTROMAGNETIC AND OPTICAL PROPERTIES (EXCEPT SPECTRA)**

- ElCl Color Effects
- ElD Dielectric Constants and Dipole Moments
- ElGd Gas Discharges
- ElMg Magnetic Susceptibility
- ElMr Magnetic Rotatory Power
- ElRf Refractive Index
- ElRo Optical Rotatory Power
- ElSc Light Scattering

Eq CHEMICAL EQUILIBRIA

- EqG Gaseous
- EqH Heterogeneous
- EqI Ionic
- EqL Liquid and Solution
- EqQ Qualitative (Observations)

Ge GENERAL AND REVIEW

In	DEUTERIUM AS AN INDICATOR OR TRACER
InBi	Biological
InKi	Reaction Kinetics
InSt	Structure Determination
Ki	CHEMICAL KINETICS
KiB	Biochemical
KiG	Gaseous
KiH	Heterogeneous
KiI	Ionic
KiL	Liquid and Solution
KiP	Photochemical
KiR	Radiochemical
Me	MECHANICAL PROPERTIES
MeAc	Acoustic Properties
MeD	Density, Compressibility, and Thermal Expansion
MeDf	Diffusion
MeSt	Surface Tension
MeV	Viscosity
No	NOMENCLATURE
Nu	NUCLEAR PROPERTIES OF DEUTERIUM
NuM	Masses and Binding Energies
NuMg	Magnetic Moments
NuR	Reactions
NuS	Spins
NuSt	Statistics
Se	SEPARATION
SeAd	Adsorption and Description
SeCf	Centrifuging
SeCh	Chemical Reaction
SeCr	Crystallization
SeDf	Diffusion (Including Thermal)
SeDs	Distillation
SeEl	Electrolysis
SeEm	Electroendosmosis
SeMs	Mass Spectrometer

So SOLUBILITY

- SoG Gases in Solids
- SoH In H_2O , HDO , and D_2O
- SoO In Organic Solvents

Sp SPECTRA AND SPECTROSCOPIC CONSTANTS

- SpA Atomic (Line) of Hydrogen and Deuterium
- SpEl Molecular Electronic
- SpFl Fluorescence
- SpVi Vibrational (Including Raman)
- SpX X-ray

Sy SYNTHESIS AND PREPARATION OF COMPOUNDS

Th THERMODYNAMIC AND RELATED PROPERTIES

- ThD Diffusion and Heat Conduction
- ThF Thermodynamic Functions for Pure Substances and Reactions between Them (E , H , F , S , C_v , C_p , ΔE , ΔH , etc.)
- ThP Phase Equilibria (Melting Points, Boiling Points, Vapor Pressures, etc., Including Heats)
- ThSo Properties of Solutions (Heats of Dilution, Vapor Pressures of Solutions, Activities, Fugacities)

On consulting one of these topics in the Subject Index, each pertinent paper may then be found by the letter-number symbols there listed.

In preparing the Compound Index, the nomenclature used in Lange's "Handbook of Chemistry" was followed. Where this nomenclature resulted in an uncommon name for a familiar compound, both names have been given. For exchange reactions with water and the use of water as a solvent, no listing under Water has been made in the Compound Index. Such research may be found by consulting appropriate sections of the Subject Index. Other substances used as solvents are indicated by (s) following the reference number. Also omitted from the Compound Index are Hydrogen and Water where the subjects involved are: Abundance, Analytical Methods, Biological Effects (except Biochemical), General and Review, Nomenclature, Nuclear Properties, Separation, Atomic Spectra. In these cases, too, the Subject Index must be consulted.

Aid in compiling the bibliography was given by Max Metlay, Thomas Crowell, Herschel Markowitz, Samuel Millman, and Mary B. Allen. The difficult task of typing the manuscript was done by Ivy Bracking and Hortense Janofsky.

Section 1

ALPHABETICAL LISTING BY AUTHOR

ABADIE, P., and CHAMPETIER, G.

- (A-1) Dielectric properties of heavy water. Compt. rend., 200: 1590-1593 (1935); C.A., 29: 4643. EqQ, ElD

ABE, S.

- (A-2) The homogeneous isotopic interchange reaction between hydrogen and a solution of alkali in heavy water. Sci. Papers Inst. Phys. Chem. Research Tokyo, 38: 287-297 (1941); C.A., 35: 6177. KiL

See also OKAMOTO, G.

ABEL, E., BRATU, E., and REDLICH, O.

- (A-3) Preliminary report on the electrolytic dissociation of heavy water. Z. physik. Chem., A170: 153 (1934); C.A., 28: 7118. EqI, EqL
- (A-4) The electrolytic dissociation of heavy water. Z. physik. Chem., A173: 353-364 (1935); C.A., 29: 7761. EcP, EqI

ABEL, E., and FABIAN, F.

- (A-5) Conductivity and hydrolysis of bromine in D₂O. Reaction velocity of $\text{BrO}_3^- + \text{DI}$. Wien. Chem. Ztg., 40: 26 (1937); C.A., 31: 2073. EcC, EqI
- (A-6) Kinetics of the halogenate-halide reaction in heavy water. Monatsh., 71: 153-154 (1938); C.A., 32: 3686. KiL
- (A-7) Some halogen equilibria in heavy water. Monatsh., 71: 241-250 (1938); C.A., 32: 4055. EqL, SoH

ABEL, E., and REDLICH, O.

- (A-8) The standard potential of deuterium. Z. Elektrochem., 44: 204-205 (1938); C.A., 32: 4084. EcP, Eq

ABEL, E., REDLICH, O., and STRICKS, W.

(A-9) Iodine-ion catalysis of hydrogen peroxide in heavy water. *Naturwissenschaften*, 22: 525 (1934); C.A., 29: 671. EqL

(A-10) Iodide catalysis of deuterium peroxide (hydrogen peroxide-d₂). *Monatsh.*, 65: 380-385 (1935); C.A., 29: 5729. EqL

ADAMS, R.

See also LEFFLER, M. T.; MCGREW, F. C.; McLEAN, A.

ADAMS, R., and TARBELL, D. S.

(A-11) Attempted resolution of phenyl-d₅-phenylaminomethane. *J. Am. Chem. Soc.*, 60: 1260-1262 (1938); C.A., 32: 4961. ElRo, MeD, ThPh

ADEL, A.

(A-12) The grating infrared solar spectrum. I. Rotational structure of the heavy water (HDO) band ν_2 at 7.12 μ . *Astrophys. J.*, 93: 506-509 (1941); C.A., 35: 4681. SpVi

ADEL, A., and BARKER, E. F.

(A-13) The vibrational energy level system of the linear molecule HCN. *Phys. Rev.*, 45: 277-279 (1934); C.A., 28: 2997. SpVi

ADICKES, F.

(A-14) Organic compounds with heavy hydrogen. A comprehensive literature review. *Angew. Chem.*, 51: 89-93 (1938); C.A., 32: 4139. ElRo, Sy

AHLBERG, J. E.

See LORD, R. C., Jr.

AKABORI, H., et al.

(A-15) Separation of isotopes by thermal diffusion. I. Preliminary test of the separation column. *Proc. Phys. Math. Soc. Japan*, 23: 590-598 (1941); C.A., 36: 333. SeDf

ALEKSANDROVICH, V. A.

(A-16) Production of heavy water. *Novosti Tekhniki*, 26-27: 50-51 (1939); C.A., 34: 4671. SeEl

ALEKSANDROVICH, V. A.

See also BRODSKII, A. I.

ALEKSANDROVICH, V. A., and SHELUD'KO, M. K.

- (A-17) Preparation of heavy water. J. Applied Chem. U.S.S.R., 13: 483-498 (1940); C.A., 35: 981. SeEl

ALEXANDER, W. A.

See also STEACIE, E. W. R.

ALEXANDER, W. A., and MUNRO, L. A.

- (A-18) Note on isotopes in snow and rain water. Can. J. Research, 14B: 47 (1936); C.A., 30: 2484. AbG

ALKHAZOV, D., and MURIN, A. N.

- (A-19) Method of separation of isotopes by means of the linear accelerator. Compt. rend. acad. sci. U.R.S.S., 30: 204-205 (1941); C.A., 35: 7825. SeMs

ALLEN, E.

See BARBOUR, H. G.

ALLISON, F.

- (A-20) The H isotopes by the magnetooptic method (title only). Phys. Rev., 44: 314 (1933). AnMg

ALYEA, H. N.

See FROST, A. A.

AMDUR, I.

- (A-21) The viscosity of deuterium. J. Am. Chem. Soc., 57: 588-589 (1935). MeV
- (A-22) Recombination of hydrogen atoms. II. Relative recombination rates of atomic hydrogen and atomic deuterium. J. Am. Chem. Soc., 57: 856-858 (1935); C.A., 29: 4225. KiG
- (A-23) Viscosity and diffusion coefficients of atomic hydrogen and atomic deuterium. J. Chem. Phys., 4: 339-343 (1936); C.A., 30: 5091. MeV, ThD

ANANTHAKRISHNAN, R.

- (A-24) The Raman spectrum of heavy water. Proc. Indian Acad. Sci., 2A: 291-302 (1935); C.A., 30: 682. SpVi
- (A-25) Raman spectrum of heavy water. Nature, 136: 551-552 (1935); C.A., 29: 7799. SpVi
- (A-26) Polarization of the Raman bands of water and deuterium oxide. Proc. Indian Acad. Sci., 3A: 201-205 (1936); C.A., 30: 5126. SpVi

ANANTHAKRISHNAN, R. (Continued)

- (A-27) Raman spectra of crystal powders. III. Exchange reactions; ammonium chloride and deuterium oxide. *Proc. Indian Acad. Sci.*, 5A: 175-184 (1937); *C.A.*, 31: 4206. EqL, SpVi, Sy

ANCHEL, M., and SCHOENHEIMER, R.

- (A-28) Deuterium as an indicator in the study of intermediary metabolism. XV. Further studies in coprosterol formation. The use of compounds containing labile deuterium for biological experiments. *J. Biol. Chem.*, 125: 23-31 (1938); *C.A.*, 32: 7985. InBi

ANDERSON, J. S.

See also JAMES, F. W.

ANDERSON, J. S., BRISCOE, H. V. A., COBB, L. H., and SPOOR, N. L.

- (A-29) Interchange of hydrogen isotopes with complex salts. II. Kinetics of the interchange with platinous and palladous tetrammines. *J. Chem. Soc.*, 1943: 367-372; *C.A.*, 37: 6528. KiL

ANDERSON, J. S., BRISCOE, H. V. A., and SPOOR, N. L.

- (A-30) Interchange of hydrogen isotopes with complex salts. I. Kinetics of the interchange with the luteocobaltic complex. *J. Chem. Soc.*, 1943: 361-367; *C.A.*, 37: 6528. KiL

ANDERSON, J. S., PURCELL, R. H., PEARSON, T. G., KING, A., JAMES, F. W., EMELEUS, H. J., and BRISCOE, H. V. A.

- (A-31) A microflotation method for the precise comparison of liquid densities and its application to a preliminary investigation of the distribution of heavy water in certain salt hydrates and to other matters. *J. Chem. Soc.*, 1937: 1492-1501; *C.A.*, 32: 405. AnDn

ANDERSON, J. S., SPOOR, N. L., and BRISCOE, H. V. A.

- (A-32) A possible acid dissociation of metal-ammonia ions and its bearing on certain reactions. *Nature*, 139: 508 (1937); *C.A.*, 31: 3805. KiL

ANDERSON, L. C.

See also BATES, J. R.; HALFORD, J. O.

ANDERSON, L. C., HALFORD, J. O., and BATES, J. R.

- (A-33) Continuous-flow methods of concentrating deuterium. *J. Chem. Phys.*, 2: 342-344 (1934); *C.A.*, 28: 5328. SeEl

ANDERSON, L. C., and MacNAUGHTON, N. W.

- (A-34) Mechanism of the catalytic reduction of some carbonyl compounds. *J. Am. Chem. Soc.*, 64: 1456-1459 (1942); *C.A.*, 36: 4477. InKi, KiH

ANDERSON, R. S., and HARVEY, E. N.

- (A-35) The effect of deuterium oxide on the luminescence of luciferin. *J. Cellular Comp. Physiol.*, 5: 249-253 (1934). KiB

ANDERSON, T. F., and YOST, D. M.

- (A-36) Raman spectrum of deuterium. *J. Chem. Phys.*, 3: 242-243 (1935); *C.A.*, 29: 3603. SpVi

ANDO, S.

See ISHIKAWA, F.

ANDREWS, D. H.

See LORD, R. C., Jr.; MURRAY, J. W.; ZIEGLER, W. T.

ANGUS, W. R., BAILEY, C. R., GLEAVE, J. L., LECKIE, A. H., RAISIN, C. G., WILSON, C. L., and INGOLD, C. K.

- (A-37) Raman spectra of deuteriobenzenes and the structure of benzene. *Nature*, 135: 1033-1034 (1935); *C.A.*, 29: 6143. SpVi

ANGUS, W. R., BAILEY, C. R., HALE, J. B., INGOLD, C. K., LECKIE, A. H., RAISIN, C. G., THOMPSON, J. W., and WILSON, C. L.

- (A-38) Structure of benzene. VII. Discussion of coincidental frequencies in the infrared and Raman spectra of benzene and hexadeuterio benzene (benzene- d_6). *J. Chem. Soc.*, 1936: 966-971; *C.A.*, 30: 7035. SpVi

- (A-39) Structure of benzene. VIII. Assignment of vibration frequencies of benzene and hexadeuteriobenzene (benzene- d_6). *J. Chem. Soc.*, 1936: 971-987; *C.A.*, 30: 7035. SpVi

ANGUS, W. R., BAILEY, C. R., INGOLD, C. K., LECKIE, A. H., RAISIN, C. G., THOMPSON, J. W., and WILSON, C. L.

- (A-40) Infrared spectrum of hexadeuteriobenzene and the structure of benzene. *Nature*, 136: 680 (1935); *C.A.*, 30: 2846. SpVi

ANGUS, W. R., BAILEY, C. R., INGOLD, C. K., and WILSON, C. L.
(A-41) Structure of benzene. I. Problem and experimental method.
J. Chem. Soc., 1936: 912-915; C.A., 30: 7033. SpVi

ANGUS, W. R., INGOLD, C. K., and LECKIE, A. H.
(A-42) Structure of benzene. III. Raman spectra of liquid benzene
and liquid hexadeuteriobenzene (benzene-d₆). J. Chem.
Soc., 1936: 925-931; C.A., 30: 7034. SpVi

ANGUS, W. R., LECKIE, A. H., and WILSON, C. L.
(A-43) Raman spectrum of trideuterioacetic deuterio acid, (acetic-
d₃-acid-d). Nature, 135: 913 (1935); C.A., 29: 5745. SpVi
(A-44) Raman spectra. III. Deuterium-substituted acetic acids.
Proc. Roy. Soc. London, A155: 183-194 (1936); C.A., 30:
5499. SpVi, Sy

ANONYMOUS

(A-45) Deuterium in water from natural sources. Natl. Bur. Stand-
ards U.S. Tech. News Bull., 196 (Aug., 1933). AbG
(A-46) Heavy hydrogen and heavy water. A review. Nature, 132:
536 (1933). BiZ, Me, NuS, Se, Gen
(A-47) Deuterium. A bibliography. Chem. Eng. News, 12: 11 (1934).
Ge
(A-48) Heavy hydrogen and heavy water. A review. Nature, 133:
197 (1934). BiZ, El, EqG, Me, SeEl, SoH, Sy
(A-49) Commercial production of heavy water. An editorial. Na-
ture, 133: 604 (1934). Se
(A-50) The biology of heavy water. A review. Nature, 133: 620
(1934). Bi
(A-51) Terminology of isotopes. Science, 79: 505 (1934). No
(A-52) The growth of animals and plants in heavy water. Science,
79: supp. p. 7 (June 22, 1934). Bi
(A-53) Hydrogen isotopes. Comment on Rutherford lecture. J. Soc.
Chem. Ind., 53: 305-306 (1934). Ge
(A-54) Electrolytic preparation of heavy water. The relation be-
tween electric current density and the isotopic separation
coefficient. J. Electrochem. Soc. Japan, 3: 127 (1935);
C.A., 30: 388. SeEl

APPLEBEY, M. P., and OGDEN, G.

(A-55) The electrolytic preparation of deuterium and the separation
coefficient α . J. Chem. Soc., 1936: 163-168; C.A., 30:
2851. SeEl

ARATO, J.

See LANYI, B.

ARCHER, C. T.

(A-56) Thermal conductivity of deuterium. *Nature*, 138: 286-287 (1936); C.A., 30: 7020. ThD

(A-57) Thermal conduction in H_2 - D_2 mixtures. *Proc. Roy. Soc. London*, A165: 474-485 (1938); C.A., 32: 6140. ThD

ARII, K.

(A-58) Sorption of heavy-water vapor by active charcoal. *Bull. Inst. Phys. Chem. Research Tokyo*, 16: 749-756 (1937); C.A., 32: 4407. AdG

ARMBRUSTER, M. H.

See La MER, V. K.

ARMSTRONG, H. E.

(A-59) Names of hydrogen isotopes. *Nature*, 133: 173 (1934). No

(A-60) The roll call of the hydrogens (hydranes). *Nature*, 133: 538-539 (1934). No

ASADA, T., and HONDE, E.

(A-61) An effect of rectified current from a tungar valve upon the electrolytic separation of heavy water. *Nature*, 139: 885-886 (1937); C.A., 31: 5688. SeEl

ASHLEY, M. F.

(A-62) ' Band spectrum of the H^1H^2 molecule. *Phys. Rev.*, 43: 770 (1933); C.A., 27: 3880. SpVi

See also LEWIS, G. N.

ASTON, F. W.

(A-63) The study of isotopes (title only). *Phys. Rev.*, 44: 313 (1933). Ge

(A-64) Hydrogen isotope of mass 2. A review. *Science Progress*, 28: 203-205 (1933); C.A., 27: 5636. SeEl

(A-65) Masses of some light atoms determined by a new method. *Nature*, 135: 541 (1935); C.A., 29: 4225. NuM, SeMs

(A-66) Isotopes, a review. *Nature*, 135: 686-687 (1935); C.A., 29: 4669. Ab, SeEl, SeMs

ASTON, F. W. (Continued)

(A-67) Masses of some light atoms measured by means of a new mass spectrograph. *Nature*, 137: 357-358 (1936); *C.A.*, 30: 3318. NuM

ATKINS, B. E.

See GREW, K. E.

AWADA, M.

See PATENTS, JAPANESE, NOGUTI, T.

AZAKAMI, S.

See IKUSHIMA, M.

BACH, F.

See also BONHOEFFER, K. F.

BACH, F., BONHOEFFER, K. F., and MOELWYN-HUGHES, E. A.

(B-1) The reaction of heavy water with bromine vapor. *Z. physik. Chem.*, B27: 71-78 (1934); *C.A.*, 29: 668. KiG

BAEHR, G.

See HEIN, F.

BAER, E.

See ERLENMEYER, H.

BAER, R.

(B-2) Velocity of ultrasonic waves in heavy water. *Helv. Phys. Acta*, 8: 500-502 (1935); *C.A.*, 31: 5644. MeAc

BAILEY, C. R.

See also ANGUS, W. R.; INGOLD, C. K.

BAILEY, C. R., BEST, A. P., GORDON, R. R., HALE, J. B., INGOLD, C. K., LECKIE, A. H., WELDON, L. H. P., and WILSON, C. L.

(B-3) *s*-Trideuteriobenzene and the structure of benzene. *Nature*, 139: 880 (1937); *C.A.*, 31: 5647. SpVi

BAILEY, C. R., HALE, J. B., INGOLD, C. K., and THOMPSON, J. W.

(B-4) Structure of benzene. IV. Infrared absorption spectra of benzene and hexadeuteriobenzene (benzene- d_6) both as vapor and as liquid. *J. Chem. Soc.*, 1936: 931-941; *C.A.*, 30: 7034. SpVi

BAILEY, C. R., THOMPSON, J. W., and HALE, J. B.

(B-5) Infrared spectra of H_2S , HDS and D_2S . *Phys. Rev.*, 49: 777 (1936); *C.A.*, 30: 4400. SpVi

BAILEY, C. R., THOMPSON, J. W., and HALE, J. B. (Continued)

- (B-6) The infrared absorption spectra of H_2S , HDS and D_2S .
J. Chem. Phys., 4: 625-631 (1936); C.A., 30: 8023. SpVi

BAINBRIDGE, K. T.

- (B-7) Isotopic weight of H^2 . Phys. Rev., 41: 115 (1932); C.A., 26: 4534. NuM
- (B-8) The isotopic weight and packing fraction of H^2 . An abstract.
Phys. Rev., 41: 396 (1932). NuM
- (B-9) The isotopic weight of H^2 . Phys. Rev., 42: 1-10 (1932); C.A., 27: 21. NuM
- (B-10) Comparison of the masses of H^2 and helium. Phys. Rev., 44: 57 (1933); C.A., 27: 4164. NuM

BAINBRIDGE, K. T., and JORDAN, E. B.

- (B-11) Atomic masses of hydrogen, helium, carbon and nitrogen isotopes. Phys. Rev., 51: 384-385 (1937); C.A., 32: 5268. NuM

BAK, B.

See BILLMAN, E.; LANGSETH, A.

BAKER, W. N.

- (B-12) A new comparison of the viscosity of D_2O with that of H_2O .
J. Chem. Phys., 4: 294-295 (1936); C.A., 30: 3291. MeV

See also La MER, V. K.

BAKER, W. N., and La MER, V. K.

- (B-13) The conductance of potassium chloride and of hydrochloric-deuteriochloric acid in H_2O - D_2O mixtures. The viscosity of H_2O - D_2O . J. Chem. Phys., 3: 406-410 (1935); C.A., 29: 5723. MeV, EcC

BALL, E. G.

- (B-14) Relative abundance of hydrogen isotopes in sea water. An abstract. Biol. Bull., 65: 371 (1933). AbG

BALL, M. R.

See COPE, O.

BALLARD, S. S., and WHITE, H. E.

- (B-15) The isotope effect in the Lyman series of hydrogen. *Phys. Rev.*, 43: 941 (1933); *C.A.*, 27: 4166. SpA

BAMANN, E.

- (B-16) Isotopy of hydrogen. Heavy water. A review. *Sueddeut. Apoth. Ztg.*, 74: 115-116 (1934); *C.A.*, 28: 2608. Ge

BANDEL, G.

See TAMMANN, G.

BANERJI, G. B., and MISHRA, B.

- (B-17) Raman effect in deuterionitric acid. *Indian J. Phys.*, 15: 359-363 (1941); *C.A.*, 36: 4027. SpVi, Sy

BANKOWSKI, O.

- (B-18) The mutual interchangeability of the hydrogen atoms of the coordination zone of a complex salt, and of water. *Monatsh.*, 65: 262-266 (1935); *C.A.*, 29: 4282. InKi

See also KLEMENC, A.

BANTLE, W.

- (B-19) Heat capacity of Seignette-electric substances. Dielectric measurements on KD_2PO_4 crystals. *Helv. Phys. Acta*, 15: 373-404 (1942); *C.A.*, 37: 28. ElD, Sy, ThF

BARBOUR, H. G.

- (B-20) Effects of heavy water on mammalian metabolism. *Proc. Soc. Exptl. Biol. Med.*, 32: 1365-1369 (1935); *C.A.*, 29: 8009. BiZ
- (B-21) The basis of the pharmacological action of heavy water in mammals. A review. *Yale J. Biol. Med.*, 9: 551-565 (1937); *C.A.*, 31: 8559. BiZ
- (B-22) Sympathomimetic influence of deuterium oxide. An abstract. *Science*, 85: 438 (1937). BiZ
- (B-23) Effects of heavy water on living cells. *Science*, 86: 587-588 (1937); *C.A.*, 32: 2552. BiZ
- (B-24) Pharmacological effects of deuterium oxide in mammals. An abstract. *Kongressbericht II, XVIth Inter. Physiological Congress, Zurich, 1938*. BiZ

See also BOGDANOVITCH, S. B.; HAMMETT, F. S.; HERRMANN, J. B.; SMITH, P. K.

BARBOUR, H. G., ALLEN, E., et al.

- (B-25) Tumor growth in mice one-fifth saturated with deuterium oxide (heavy water). *Am. J. Cancer*, 32: 440-446 (1938); *C.A.*, 32: 6730. BiZ

BARBOUR, H. G., and BOGDANOVITCH, S. B.

- (B-26) The pharmacological action of deuterium oxide. II. Evidence from fish melanophores for sympathomimetic action. *J. Pharmacol. Exptl. Therap.*, 61: 148-152 (1937); *C.A.*, 32: 199. BiZ

BARBOUR, H. G., and COCHRAN, F. J.

- (B-27) Apparatus for heavy water studies in small animals. *Science*, 82: 179-180 (1935); *C.A.*, 29: 7371. BiZ

BARBOUR, H. G., and DICKERSON, V. C.

- (B-28) Pharmacological action of deuterium oxide. VII. Its effect on the hydrolysis of acetylcholine. *J. Pharmacol. Exptl. Therap.*, 65: 281-286 (1939); *C.A.*, 33: 3884. BiC

BARBOUR, H. G., and HAMMETT, F. S.

- (B-29) Heavy water and longevity. *Science*, 90: 538-539 (1939); *C.A.*, 34: 2938. BiZ

BARBOUR, H. G., and HERRMANN, J. B.

- (B-30) The pharmacological action of deuterium oxide. IV. The sympathomimetic action of deuterium oxide on mice. *J. Pharmacol. Exptl. Therap.*, 62: 158-164 (1938); *C.A.*, 32: 3023. BiZ

BARBOUR, H. G., and RICE, L. E.

- (B-31) Stimulation of the metabolism in mice by continued administration of 40 per cent deuterium oxide. *J. Pharmacol. Exptl. Therap.*, 60: 97 (1937). BiZ
- (B-32) The pharmacological action of deuterium oxide. V. Calorigenic saturation level and the influence of ergotoxin. *J. Pharmacol. Exptl. Therap.*, 62: 292-300 (1938); *C.A.*, 32: 3820. BiC
- (B-33) The pharmacological action of deuterium oxide. VI. Its influence upon the insensible water loss. *J. Pharmacol. Exptl. Therap.*, 62: 363-371 (1938); *C.A.*, 32: 4657. BiZ

BARBOUR, H. G., and TRACE, J.

- (B-34) The effects of deuterium oxide on the respiratory and water exchanges of mice. An abstract. *J. Pharmacol. Exptl. Therap.*, 57: 113 (1936). BiZ
- (B-35) The pharmacological action of deuterium oxide. I. Toxicity and symptoms; metabolic rate; water exchanges. *J. Pharmacol. Exptl. Therap.*, 58: 460-482 (1936); *C.A.*, 31: 1055. BiZ

BARDEEN, J.

- (B-36) Concentration of isotopes by thermal diffusion: rate of approach to equilibrium. *Phys. Rev.*, 57: 35-41 (1939); *C.A.*, 34: 2250. SeDf
- (B-37) Concentration of isotopes by thermal diffusion: rate of approach to equilibrium. *Phys. Rev.*, 58: 94-95 (1940); *C.A.*, 34: 6522. SeDf

BARKER, D. E.

See ViSScher, M. B.

BARKER, E. F.

See also ADEL, A.; BARTUNEK, P. F.; GALLAWAY, W. S.; GINSBURG, N.; HARDY, J. D.; MIGEOTTE, M. V.; POSEY, L. R.; RANDALL, H. M.; SLEATOR, W. W.

BARKER, E. F., and BOSSCHIETER, G.

- (B-38) The infrared absorption spectra of CH_3OD and CH_2DOD . *J. Chem. Phys.*, 6: 563-568 (1938); *C.A.*, 32: 8268. SpVi

BARKER, E. F., and GINSBURG, N.

- (B-39) The infrared spectrum of methyl deuteride. *J. Chem. Phys.*, 2: 299 (1934); *C.A.*, 28: 4310. SpVi

BARKER, E. F., and MIGEOTTE, M.

- (B-40) Low-frequency double vibrations of the deuterioammonias. *Phys. Rev.*, 47: 702 (1934); *C.A.*, 29: 3913. SpVi

BARKER, E. F., and SLEATOR, W. W.

- (B-41) Infrared spectrum of heavy water. *J. Chem. Phys.*, 3: 660-663 (1935); *C.A.*, 30: 382. SpVi

BARNES, R. B.

- (B-42) The pure rotation spectra of NH_3 and ND_3 . *Phys. Rev.*, 47: 658-661 (1935); *C.A.*, 29: 5019. SpVi

BARNES, R. B. (Continued)

See also BENEDICT, W. S.

BARNES, R. B., BENEDICT, W. S., and LEWIS, C. M.

- (B-43) Rotation spectra of NH_3 and NH_3^2 . *Phys. Rev.*, 45: 347 (1934); *C.A.*, 28: 2617. SpVi

BARNES, R. B., and BRATTAIN, R. R.

- (B-44) The near infrared spectrum of benzene- d_6 . *J. Chem. Phys.*, 3: 446-449 (1935); *C.A.*, 29: 6503. SpVi

BARNES, T. C.

- (B-45) Possible physiological effect of the heavy isotope of hydrogen in water. *J. Am. Chem. Soc.*, 55: 4332-4333 (1933); *C.A.*, 27: 5783. BiZ
- (B-46) Further observations on the physiological effect of the heavy hydrogen isotope on *Spirogyra*. *Am. J. Botany*, 20: 681 (1933). BiZ
- (B-47) The effect of heavy water of low concentration on *Euglena*. *Science*, 79: 370 (1934); *C.A.*, 28: 3752. BiZ
- (B-48) Alleged stimulation of moulds by paraffin in heavy water. *Nature*, 134: 573 (1934). BiB
- (B-49) The biological effects of heavy water. *Am. J. Sci.*, 30: 14-15 (1935); *C.A.*, 29: 6255. Bi
- (B-50) Bioelectrical potential in heavy water. *Science*, 83: 506 (1936); *C.A.*, 30: 4885. BiZ
- (B-51) Experiments on *Ligia* in Bermuda. IV. The effects of heavy water and temperature. *Biol. Bull.*, 70: 109-117 (1936). BiZ
- (B-52) Influence of heavy water and temperature on the electrical potential of frog skin. *J. Cellular Comp. Physiol.*, 13: 39-50 (1939); *C.A.*, 33: 3404. BiZ
- (B-53) The combined effects of heavy water and adrenaline on the rate and action current of the excised auricles of the turtle. *Am. J. Physiol.*, 129: 664-671 (1940); *C.A.*, 34: 5178. BiZ

See also LARSON, E. J.

BARNES, T. C., and GAW, H. Z.

- (B-54) Chemical basis for some biological effects of heavy water. *J. Am. Chem. Soc.*, 57: 590-591 (1935); *C.A.*, 29: 2986. Bi, KiB

BARNES, T. C., and LARSON, E. J.

- (B-55) Further experiments on the physiological effects of heavy water and of ice water. *J. Am. Chem. Soc.*, 55: 5059-5060 (1933); *C.A.*, 28: 795. BiZ
- (B-56) Influence of heavy water of low concentration on *Spirogyra*, *Planaria* and on enzyme action. *Protoplasma*, 22: 431-443 (1934); *C.A.*, 29: 1838. BiZ, KiB

BARNES, T. C., and WARREN, J.

- (B-57) The heart rate in heavy water. *Science*, 81: 346 (1935); *C.A.*, 29: 4032. BiZ
- (B-58) The combined effects of heavy water and temperature on the heart rate of the turtle. *Physiol. Zool.*, 10: 71-83 (1937); *C.A.*, 31: 1831. BiZ

BARNES, W. H.

See BROWN, R. S.

BARONI, E.

- (B-59) The deuterium content of atmospheric precipitation. *Atti X° Congr. intern. chim. Rome*, 2: 110 (1938). *Chem. Zentr.*, 1: 3881 (1940); *C.A.*, 36: 4744. AbG

BARONI, E., and FINK, A.

- (B-60) Investigation of the concentration of D_2O in natural ice. *Monatsh.*, 65: 386-390 (1935); *C.A.*, 29: 5343. AbG
- (B-61) Investigation of the concentration of deuterium oxide in natural ice. II. *Monatsh.*, 67: 131-136 (1935); *C.A.*, 30: 2483. AbG
- (B-62) Investigation of the concentration of deuterium oxide in natural ice. III. *Monatsh.*, 67: 193-195 (1936); *C.A.*, 30: 2483. AbG
- (B-63) Investigation of the concentration of deuterium oxide in natural ice. IV. *Monatsh.*, 71: 128-130 (1937); *C.A.*, 32: 1529. AbG

BARRER, R. M.

- (B-64) The rates of interaction of proto- and deuterio-hydrogen and methane with charcoal. *Trans. Faraday Soc.*, 32: 481-486 (1936); *C.A.*, 30: 2830. AdG
- (B-65) The interaction of light and heavy water with aluminum carbide and calcium phosphide. *Trans. Faraday Soc.*, 32: 486-490 (1936); *C.A.*, 30: 2830. EqH

BARRER, R. M. (Continued)

- (B-66) The thermal decomposition of light and heavy ammonia and phosphine on tungsten. Trans. Faraday Soc., 32: 490-501 (1936); C.A., 30: 2831. ThF

BARRER, R. M., and RIDEAL, E. K.

- (B-67) Interaction of hydrogen with microcrystalline charcoal. I. Proc. Roy. Soc. London, A149: 231-253 (1935); C.A., 29: 4234. AdG

BARRETT, H. M., BEST, C. H., and RIDOUT, J. H.

- (B-68) A study of the source of liver fat using deuterium as an indicator. J. Physiol. London, 93: 367-381 (1938); C.A., 32: 9234. AnDn, InBi, MeD

BARTER, C. A.

See LIBBY, W. F.

BARTHOLOMÉ, E.

- (B-69) Equations of state of the condensed hydrogen isotopes. I. Experimental determination of quantities of state. Z. physik. Chem., B33: 387-404 (1936); C.A., 31: 15. MeD, ThPh
- (B-70) Molecular vibration in deuterio compounds. A review. Z. Elektrochem., 44: 15-21 (1938); C.A., 32: 2410. SpVi

BARTHOLOMÉ, E., and CLUSIUS, K.

- (B-71) The infrared spectrum of heavy water vapor. Z. Elektrochem., 40: 529-531 (1934); C.A., 28: 6368. SpVi
- (B-72) The infrared spectrum of heavy water vapor. Naturwissenschaften, 22: 420 (1934); C.A., 28: 7159. SpVi
- (B-73) Caloric measurements of heavy water. Z. physik. Chem., B28: 167-177 (1935); C.A., 29: 3588. ThPh

See also CLUSIUS, K.

BARTHOLOMÉ, E., DRIKOS, G., and EUCKEN, A.

- (B-74) The transitions of solid methane-d₄ and its mixtures with methane. Z. physik. Chem., B39: 371-384 (1938); C.A., 32: 6536. ThF

BARTHOLOMÉ, E., and EUCKEN, A.

- (B-75) The direct calorimetric estimation of C_v for the isotopes of

BARTHOLOMÉ, E., and EUCKEN, A. (Continued)

hydrogen in solid and liquid states. *Z. Elektrochem.*, 42: 547-551 (1936); *C.A.*, 30: 7437. ThF

BARTHOLOMÉ, E., and SACHSSE, H.

(B-76) Interpretation of the vibrational spectrum of organic molecules by means of the isotope effect. *Z. physik. Chem.*, B30: 40-52 (1935); *C.A.*, 30: 960. SpVi

BARTUNEK, P. F., and BARKER, E. F.

(B-77) The fundamental band of DCN at 17.5 μ . *Phys. Rev.*, 47: 330 (1935); *C.A.*, 30: 7443. SpVi

(B-78) The infrared absorption spectra of the linear molecules, carbonyl sulfide and deuterium cyanide. *Phys. Rev.*, 48: 516-521 (1935); *C.A.*, 29: 7188. SpVi

BATES, J. R.

See also ANDERSON, L. C.; COOK, G. A.; HALFORD, J. O.

BATES, J. R., ANDERSON, L. C., and HALFORD, J. O.

(B-79) Raman spectra of deuterioacetones and methyl alcohol-d. *J. Chem. Phys.*, 4: 535 (1936); *C.A.*, 30: 6646. SpVi

BATES, J. R., HALFORD, J. O., and ANDERSON, L. C.

(B-80) A comparison of some physical properties of hydrogen and deuterium iodides. *J. Chem. Phys.*, 3: 415-420 (1935); *C.A.*, 29: 5717. SpVi, ThPh

(B-81) A comparison of some physical properties of hydrogen and deuterium bromides. *J. Chem. Phys.*, 3: 531-534 (1935); *C.A.*, 29: 7165. SpVi, ThPh

BATH, J.

See ELLIS, J. W.

BAUER, E., and MAGAT, M.

(B-82) Raman spectrum of heavy water. *Compt. rend.*, 201: 667-669 (1935); *C.A.*, 30: 26. SpVi

BAWN, C. E. H.

(B-83) Hydrogen isotopes and the wave nature of matter. A review. *Chemistry & Industry*, 1934: 606-610; *C.A.*, 28: 5754. Ge

BAWN, C. E. H., and EVANS, A. G.

- (B-84) Rates of reaction of sodium atoms with hydrogen and deuterium chlorides. *Trans. Faraday Soc.*, 31: 1392-1400 (1935); C.A., 30: 363. KiG, ThF

BAWN, C. E. H., and OGDEN, G.

- (B-85) Wave-mechanical effects and the reactivity of the hydrogen isotopes. *Trans. Faraday Soc.*, 30: 432-433 (1934); C.A., 28: 4305. SeDf, ThF

BAXENDALE, J. H., and WARHURST, E.

- (B-86) Hydrogenation and exchange reactions of methyl oleate. *Trans. Faraday Soc.*, 36: 1181-1188 (1940); C.A., 35: 2400. InKi, KiH

BAYEN, M.

- (B-87) Ultraviolet refraction-dispersion of heavy water. *Compt. rend.*, 206: 1715-1717 (1938); C.A., 32: 6154. ElRf
- (B-88) Indexes of refraction in ultraviolet. *J. phys. radium* (8), 3: 57-68 (1942); C.A., 37: 1644. ElRf

BAYUSHKINA, K. S.

See KAPUSTINSKII, A. F.

BEAMS, J. W., and HAYNES, F. B.

- (B-89) The separation of isotopes by centrifuging. *Phys. Rev.*, 50: 491-492 (1936); C.A., 30: 7449. SeCf

BECK, C. A., and SPONER, H.

- (B-90) The near-ultraviolet absorption spectrum of monodeuterio-benzene. *J. Chem. Phys.*, 10: 575-581 (1942); C.A., 36: 6412. SpEl

BEEBE, R. A.

See also SOLLER, T.

BEEBE, R. A., and DOWDEN, D. A.

- (B-91) Heats of adsorption of gases on chromic oxide at low temperatures. *J. Am. Chem. Soc.*, 60: 2912-2922 (1938); C.A., 33: 3653. AdG, ThPh

BEEBE, R. A., LOW, G. W., Jr., WILDNER, E. L., and GOLDWASSER, S.

- (B-92) The adsorption of hydrogen and deuterium on copper at low

BEEBE, LOW, WILDNER, and GOLDWASSER (Continued)

pressures. J. Am. Chem. Soc., 57: 2527-2532 (1935); C.A., 30: 2073. AdG, ThPh

BEEBE, R. A., and ORFIELD, H. M.

- (B-93) Heats of adsorption at -183° ; hydrogen on chromic oxide. J. Am. Chem. Soc., 59: 1627-1629 (1937); C.A., 31: 7735. AdG, ThPh

BEHOUNEK, O.

See SCHACHERL, F.

BELL, J.

- (B-94) Influence of heavy water on the color of hydrated salts. Nature, 137: 534 (1936); C.A., 30: 3735. ElCl
(B-95) Salt hydrates and deuterates. I. Dissociation pressures of certain deuterates. J. Chem. Soc., 1937: 459-461; C.A., 31: 4568. ThPh
(B-96) Salt hydrates and deuterates. II. Correlation of heats of dissociation and structure. J. Chem. Soc., 1940: 72-74; C.A., 34: 2692. ThPh

BELL, R. P.

- (B-97) Theory of the electrolytic separation of isotopes. J. Chem. Phys., 2: 164-166 (1934); C.A., 28: 3656. SeEl
(B-98) Quantum mechanical effects in reactions involving hydrogen. Proc. Roy. Soc. London, A148: 241-250 (1935); C.A., 29: 2842. KiG
(B-99) Alleged isotopic interchange between water and acetylene. J. Am. Chem. Soc., 57: 778-779 (1935); C.A., 29: 3596. EqQ
(B-100) The dipole moment of isotopic molecules. Trans. Faraday Soc., 31: 1345-1347 (1935); C.A., 29: 7721. ElD
(B-101) The repulsive forces between isotopic molecules. Proc. Roy. Soc. London, A174: 504-509 (1940); C.A., 34: 3579. ThF

See also EDWARDS, A. J.; ROBINSON, R. A.

BELL, R. P., and COOP, I. E.

- (B-102) Dipole moments of hydrogen and diplogen (deuterium) chlorides. Trans. Faraday Soc., 34: 1209-1214 (1938); C.A., 33: 1188. ElD, Sy

BELL, R. P., and WOLFENDEN, J. H.

(B-103) Electrolytic concentration of deuterium. *Nature*, 133: 25-26 (1934); C.A., 28: 1922. SeEl

(B-104) The association of water and deuterium oxide in dioxane solution. *J. Chem. Soc.*, 1935: 822-824; C.A., 29: 7160. EqL, ThSo

BELTON, J. W., and EVANS, M. G.

(B-105) The molecular forces involved in surface formation. II. Surface free energies of simple liquid mixtures. *Trans. Faraday Soc.*, 41: 1-12 (1945); C.A., 39: 2443. MeSt

BEMMELS, C.

See REYERSON, L. H.

BENEDICT, W. S.

(B-106) Ultraviolet absorption spectra of the deuterioammonias. *Phys. Rev.*, 47: 641 (1935); C.A., 30: 7444. SpU, SpEl

See also BARNES, R. B.; BOWMAN, P. L.; MORIKAWA, K.; TAYLOR, H. S.

BENEDICT, W. S., MORIKAWA, K., BARNES, R. B., and TAYLOR, H. S.

(B-107) The analysis of isotopic mixtures of deuterio-methanes and -ethanes by infrared absorption spectra. *J. Chem. Phys.*, 5: 1-9 (1937); C.A., 31: 945. SpVi

BENNETT, W. H., and THOMAS, L. H.

(B-108) Mobilities in some free electron gases. *Phys. Rev.*, 62: 41-47 (1942); C.A., 36: 5420. EcC

See also DARBY, P. F.

BERG, B. N.

See BLOCH, K.; SCHOENHEIMER, R.

BERNAL, J. D.

See also FOWLER, R. H.

BERNAL, J. D., and FOWLER, R. H.

(B-109) A theory of water and ionic solution, with particular reference to hydrogen and hydroxyl ions. *J. Chem. Phys.*, 1: 515-548 (1933); C.A., 27: 5232. EcC

BERNAL, J. D., and TAMM, G.

- (B-110) Zero-point energy and physical properties of H_2O and D_2O .
Nature, 135: 229-230 (1935); C.A., 29: 2809. ThF

BERNARD, E., and MANNEBACK, C.

- (B-111) Calculation of the frequencies and fundamental modes of perpendicular vibration of molecules of deuterioethylene $\text{C}_2\text{H}_x\text{D}_y$ ($x + y = 4$). Ann. soc. sci. Bruxelles, Ser. I, 59: 113-124 (1939); C.A., 33: 5715. SpVi

BERNARD, E., MANNEBACK, C., and VERLEYSSEN, A.

- (B-112) Potential functions of the plane vibrations of the benzene molecule. Calculations of the normal frequencies of plane vibrations of the molecules *sym*- $\text{C}_6\text{H}_3\text{D}_3$, *p*- $\text{C}_6\text{H}_4\text{D}_2$ and *p*- $\text{C}_6\text{H}_2\text{D}_4$. Ann. soc. sci. Bruxelles, Ser. I, 59, No. 3: 376-402 (1939); C.A., 34: 3591. SpVi
- (B-113) Potential function of the plane vibrations of the benzene molecule. Calculation of the normal frequencies of *sym*- $\text{C}_6\text{H}_3\text{D}_3$, *p*- $\text{C}_6\text{H}_4\text{D}_2$ and *p*- $\text{C}_6\text{H}_2\text{D}_4$. Ann. soc. sci. Bruxelles, Ser. I, 60: 45-59 (1940); C.A., 34: 5755. SpVi

BERNHARD, K.

- (B-114) Source of acetyl groups in vivo. I. Acetylation of sulfanilimide with *p*-aminobenzoic acid during simultaneous dosage with deuterioacetic acid. Z. physiol. Chem., 267: 91-98 (1940); C.A., 35: 3693. BiC
- (B-115) Chemical embryology. Lipide synthesis in the chick embryo. Helv. Chim. Acta, 24: 1094-1098 (1941); C.A., 36: 2318. InBi
- (B-116) Biological degradation of fatty acids through methyl oxidation. Recovery and metabolism of dicarboxylic acids containing deuterium. Helv. Chim. Acta, 24: 1412-1425 (1941); C.A., 36: 3812. BiC, InBi, Sy, ThPh
- (B-117) Metabolic studies using isotopes. A review. Schweiz. med. Wochschr., 71: 317-319 (1941); C.A., 36: 5869. InBi

BERNHARD, K., and GRESSLY, E.

- (B-118) Oxidation of the benzene ring in the animal body. Helv. Chim. Acta, 24: 83-88 (1941); C.A., 35: 4785. InBi

BERNHARD, K., and SCHOENHEIMER, R.

- (B-119) The inertia of highly unsaturated fatty acids in the animal investigated with deuterium. J. Biol. Chem., 133: 707-712 (1940); C.A., 34: 4128. InBi

BERNHARD, K., and SCHOENHEIMER, R. (Continued)

- (B-120) Rate of formation of stearic and palmitic acids in normal mice. *J. Biol. Chem.*, 133: 713-720 (1940); *C.A.*, 35: 2575. InBi

BERNSTEIN, H. J.

See LANGSETH, A.

BERTRAM, S. H., and MENDEL, H.

- (B-121) Boeton asphalt and deuterium. *Chem. Weekblad*, 33: 687-689 (1936); *C.A.*, 31: 1667. AbG

BEST, A. P.

See also BAILEY, C. R.

BEST, A. P., and WILSON, C. L.

- (B-122) Direct introduction of deuterium into the aromatic nucleus. II. Orientation by certain substituents. *J. Chem. Soc.*, 1938: 28-29; *C.A.*, 32: 2090. Sy

BEST, C. H.

See BARRETT, H. M.

BETHE, H. A.

- (B-123) Masses of light atoms from transmutation data. *Phys. Rev.*, 47: 633-634 (1935); *C.A.*, 29: 3908. NuM

- (B-124) The meson theory of nuclear forces. II. Theory of the deuteron. *Phys. Rev.*, 57: 390-413 (1940); *C.A.*, 34: 5734. NuM

BETZ, H.

See GUENTHERSCHULZE, A.

BEUTLER, H.

- (B-125) The heat of dissociation of the hydrogen molecule, H_2 , determined from a new ultraviolet resonance band branch. (The heats of dissociation of HD , D_2 and HCl .) *Z. physik. Chem.*, B27: 287-302 (1934); *C.A.*, 29: 1316. SpEl

BEUTLER, H., BRAUER, G., and JUENGER, H. O.

- (B-126) Direct chemical preparation of HD . *Naturwissenschaften*, 24: 347 (1936); *C.A.*, 31: 15. Sy

BEUTLER, H., DEUBNER, A., and JUENGER, H. O.

- (B-127) The absorption spectrum of hydrogen. II. The ordering of

BEUTLER, H., DEUBNER, A., and JUENGER, H. O. (Continued)

the D level into the term scheme of hydrogen from exposures of H_2 and D_2 . Z. Physik, 98: 181-197 (1935); C.A., 30: 1655. SpEl

BEUTLER, H., and MIE, K.

(B-128) Ultraviolet bands of HH^2 Naturwissenschaften, 22: 419 (1934); C.A., 28: 7157. SpEl

BEWERSDORFF, O.

(B-129) Explanation of the anomalous intensities in the band $2p^1\Sigma_u \rightarrow 1s^1\Sigma_g$ ($v' = 3 \rightarrow v'' = 0$ to 11) of the HD molecule. Z. Physik, 103: 598-620 (1936); C.A., 31: 2927. SpEl

BHAGAVANTAM, S.

(B-130) Depolarization of the light scattered by heavy water. Current Sci. India, 4: 94 (1935); C.A., 30: 26. ElSc

(B-131) Raman spectrum of deuterium. I. Proc. Indian Acad. Sci., 2A: 303-309 (1935); C.A., 30: 682. SpVi

(B-132) Raman spectrum of hydrogen deuteride. Proc. Indian Acad. Sci., 2A: 310-312 (1935); C.A., 30: 682. SpVi

(B-133) Raman spectrum of deuterium. II. Intensity and polarization characters. Proc. Indian Acad. Sci., 2A: 477-482 (1935); C.A., 30: 3322. SpV!

BHAGAVANTAM, S., and RAO, B. S. R.

(B-134) Adiabatic and isothermal compressibilities of heavy water. Nature, 140: 1099 (1937); C.A., 32: 1534. MeD

(B-135) Light scattering and other allied physical properties of ordinary and heavy water. Proc. Indian Acad. Sci., 7A: 35-37 (1938); C.A., 32: 4032. ElSc, MeD

BILLMAN, E., JENSEN, K. A., and BAK, B.

(B-136) 2-Deuterocamphane. Ber., 69B: 1947-1949 (1936); C.A., 30: 6728. ElRo

BILLMAN, E., JENSEN, K. A., and KNUTH, E.

(B-137) An optically active 2-deuteriocamphane. Ber., 69B: 1031-1035 (1936); C.A., 30: 4844. ElRo

BIJL, A.

(B-138) Thermal properties of helium, hydrogen and deuterium. Nature, 138: 723-724 (1936); C.A., 31: 601. ThF

BIJL, A. (Continued)

- (B-139) Separation of isotopes by thermal diffusion. Nederland. Tijdschr. Natuurk., 7: 147-153 (1940); C.A., 34: 7736. SeDf

BINGHAM, E. C., and STEVENS, W. H., Jr.

- (B-140) Heavy water inert, due to low association. J. Chem. Phys., 2: 107-108 (1934); C.A., 28: 2233. Me, Th

BIRGE, R. T.

- (B-141) The values of R and e/m from the spectra of H, D, and He^+ . Phys. Rev., 60: 766-785 (1941); C.A., 36: 703. SpA

BIRNTHALER, W., and LANGE, E.

- (B-142) Heat of dilution of a few salts in D_2O and H_2O solutions at 25° . Z. Elektrochem., 43: 643-659 (1937); C.A., 31: 7736. ElD, ThSo

- B-143) Isotopic effects in heats of dilution in highly concentrated solutions of electrolytes and in water-dioxane mixtures at 25° . Z. Elektrochem., 44: 679-693 (1938); C.A., 33: 31. ThF, ThSo

- B-144) Thermochemistry of heavy water. Heats of dilution of D_2O or H_2O with dioxane. Sitzber. physik. med. Sozietät Erlangen, 70: 1-4 (1938); C.A., 33: 8099. ThSo

BITTERLIN, O.

See ERLLENMEYER, H.

BLACK, J. F., and TAYLOR, H. S.

- B-145) Equilibrium in hydrogen-water systems containing tritium. J. Chem. Phys., 11: 395-402 (1943). EqH

BLAGG, J. C. L., and MURPHY, G. M.

- B-146) The rate of thermal decomposition of deuterium iodide. J. Chem. Phys., 4: 631-638 (1936); C.A., 30: 7976. KiG, ThF

BLATT, H.

See COPE, O.

BLEAKNEY, W.

- B-147) Additional evidence for an isotope of hydrogen of mass 2. Phys. Rev., 39: 536 (1932); C.A., 26: 2373. AnMs

BLEAKNEY, W. (Continued)

- (B-148) Study of H^2H^1 ion by use of mass spectrograph. An abstract. Phys. Rev., 40: 130 (1932). AnMs
- (B-149) A search for isotopes on hydrogen and helium. Phys. Rev., 41: 32-38 (1932); C.A., 26: 5833. AnMs
- (B-150) Some properties of the hydrogen isotopes as revealed by the mass spectrograph. An abstract. Phys. Rev., 45: 762 (1934); C.A., 29: 4665. AnMs

See also GOULD, A. J.; LOZIER, W. W.; RITTENBERG, D.; SELWOOD, P. W.; TAYLOR, H. S.

BLEAKNEY, W., and GOULD, A. J.

- (B-151) The relative abundance of hydrogen isotopes. Phys. Rev., 44: 265-268 (1933); C.A., 27: 5243. AbG
- (B-152) Concentration of H^2 and O^{18} in heavy water. Phys. Rev., 45: 281-282 (1934); C.A., 28: 2609. AnMs

BLEGEN, E.

See HANSEN, K.

BLOCH, K., BERG, B. N., and RITTENBERG, D.

- (B-153) Biological conversion of cholesterol to cholic acid. J. Biol. Chem., 149: 511-517 (1943); C.A., 37: 6282. InBi

BLOCH, K., and RITTENBERG, D.

- (B-154) The biological formation of cholesterol from acetic acid. J. Biol. Chem., 143: 297-298 (1942); C.A., 36: 3203. Sy
- (B-155) Preparation of deuteriocholesterol. J. Biol. Chem., 149: 505-509 (1943); C.A., 37: 6282. Sy

BLOKHINTZEV, D. I. (BLOCHINZEW, D. I.)

- (B-156) The deuteron theory. Physik. Z. Sowjetunion, 8: 270-274 (1935); C.A., 30: 952. NuM

BLOKKER, P. C.

- (B-157) The diffusion of cathodic hydrogen and deuterium through iron. Rec. trav. chim., 55: 979-988 (1936); C.A., 31: 1278. AdG

BLOOM, L. R.

See TYKOCINER, J. T.

BLUE, R. W.

See DIEKE, G. H.

BLUSCHKE, H.

See MATOSSI, F.

BODSON, H.

See TIMMERMANS, J.

BOEHM, H.

See JOOS, G.

BOEHME, J.

(B-158) Isotopy of hydrogen, heavy water. A review. *Z. physik. chem. Unterricht*, 47: 216-223 (1934). AnMs, Bi, SeDf, SeEl, SpA

BOER, J. de

(B-159) Intermolecular field of H and D and the quantum mechanical theory of the equation of state. *Physica*, 10: 357-364 (1943); C.A., 38: 5118. ThF

BOETIUS, M.

See STEINKOPF, W.

BOGDANOVICH, S. B.

(B-160) Further investigations of the effect of tissues on autonomic drugs. *Proc. Soc. Exptl. Biol. Med.*, 37: 182-183 (1937); C.A., 32: 5061. BiZ

(B-161) A pharmacological study of factors influencing the isolated melanophores of *Fundulus heteroclitus*. *Arch. intern. pharmacodynamie*, 59: 227-231 (1938); C.A., 32: 9299. BiZ

See also BARBOUR, H. G.

BOGDANOVICH, S. B., and BARBOUR, H. G.

(B-162) The effect of deuterium oxide on melanophores. An abstract. *J. Pharmacol. Exptl. Therap.*, 60: 99 (1937). BiZ

(B-163) The pharmacological action of deuterium oxide. III. Its protective effect on acetylcholine and epinephrine. *J. Pharmacol. Exptl. Therap.*, 62: 149-157 (1937); C.A., 32: 3022. BiC

BOK, L. D. C., and GEIB, K. H.

- (B-164) Exchange reactions of acetic acid and acetate ion in heavy water. *Naturwissenschaften*, 26: 122 (1938); C.A., 32: 5283. EqQ
(B-165) Exchange of hydrogen in aqueous solutions of acetic acid and acetates. *Z. physik. Chem.*, A183: 353-370 (1939); C.A., 33: 3240. KiL

BOLLAND, J. L.

See also MELVILLE, H. W.

BOLLAND, J. L., and MELVILLE, H. W.

- (B-166) Analysis of ternary gas mixtures by thermal conductivity measurements. *Nature*, 140: 63 (1937); C.A., 31: 6582. AnTh, ThD
(B-167) Microthermal-conductivity gauges. *Trans. Faraday Soc.*, 33: 1316-1329 (1937); C.A., 31: 8264. AnTh, ThD

BONHOEFFER, K. F.

- (B-168) Heavy water. *Angew. Chem.*, 46: 776-779 (1933); C.A., 28: 967. Ge
(B-169) Reactions of heavy hydrogen. *Z. Elektrochem.*, 40: 469-474 (1934); C.A., 28: 6448. BiB, EqH, EqQ, KiG, KiL
(B-170) Enzyme action in heavy water. *Ergeb. Enzymforsch.*, 6: 47-56 (1937); C.A., 31: 6261. BiC, KiB
(B-171) Physiological-chemical investigations with deuterio compounds. *Z. Elektrochem.*, 44: 87-98 (1938); C.A., 32: 2411. BiZ, InBi, InKi
(B-172) Deuteron transfer in solutions. A review. *Trans. Faraday Soc.*, 34: 252-259 (1938); C.A., 32: 2814. KiI

See also BACH, F.; FREDENHAGEN, H.; GEIB, K. H.; GUENTHER, G.; HOCHBERG, J.; JUNGERS, J. C.; MOELWYN-HUGHES, E. A.; REITZ, O.; SALZER, F.; WALTERS, W. D.; WIRTZ, K.

BONHOEFFER, K. F., BACH, F., and FAJANS, E.

- (B-173) Measurement of reaction velocity with heavy hydrogen. *Z. physik. Chem.*, A168: 313-314 (1934); C.A., 28: 5742. KiG

BONHOEFFER, K. F., and BROWN, G. W.

- (B-174) The exchange of hydrogen between water and hydrogen compounds dissolved in it. *Z. physik. Chem.*, B23: 171-174 (1933); C.A., 28: 406. EqQ

BONHOEFFER, K. F., and FREDENHAGEN, H.

(B-175) The Cannizzaro reaction. *Naturwissenschaften*, 25: 459 (1937); C.A., 31: 8510. InKi

BONHOEFFER, K. F., and GUENTHER, G.

(B-176) The polysaccharide synthesis in the yeast cell. *Naturwissenschaften*, 25: 459 (1937); C.A., 31: 8589. InBi

BONHOEFFER, K. F., and KLAR, R.

(B-177) Exchange of heavy hydrogen atoms between water and organic compounds. *Naturwissenschaften*, 22: 45 (1934); C.A., 28: 2609. EqL

BONHOEFFER, K. F., and REITZ, O.

(B-178) The mechanism of hydrogen-ion catalysis. *Z. physik. Chem.*, A179: 135-147 (1937); C.A., 31: 7732. KiL

BONHOEFFER, K. F., and RUMMEL, K. W.

(B-179) Exchange of heavy hydrogen atoms between water and molecular hydrogen. *Naturwissenschaften*, 22: 45 (1934); C.A., 28: 2609. EqQ

BONHOEFFER, K. F., and SALZER, F.

(B-180) The enzymic decomposition of glucosides in heavy water. *Naturwissenschaften*, 23: 867 (1935); C.A., 30: 2587. BiC, KiB

BONHOEFFER, K. F., and WALTERS, W. D.

(B-181) Enolization and aldol condensation. *Z. physik. Chem.*, A181: 441-448 (1938); C.A., 32: 6933. InKi, KiL

BONINO, G. B., and MANZONI-ANSIDEI, R.

(B-182) The Raman Spectrum of N-deuteriopyrrole. *Atti accad. nazl. Lincei, Classe sci. fis. mat. e nat.*, 25: 494-497 (1937); C.A., 31: 8377. SpVi

(B-183) Raman spectrum of o-deuteroxybenzaldehyde (salicylaldehyde-O-d). *Atti accad. nazl. Lincei, Classe sci. fis. mat. e nat.*, 28: 259-264 (1938); C.A., 33: 7195. SpVi, Sy

(B-184) Chelation. VII. Preparation and Raman spectrum of o-deuteriohydroxybenzaldehyde (o-hydroxy-d-benzaldehyde). *Ricerca sci. e Ricostruz.*, 9, II: 470-472 (1938); C.A., 33: 9138. SpVi, Sy

BONNER, L. G.

(B-185) The vibrational spectrum of water vapor. *Phys. Rev.*, 46: 458-464 (1934); C.A., 29: 48. SpVi

BONNER, L. G., and HOFSTADTER, R.

- (B-186) Vibration spectra and molecular structure. IV. The infrared absorption spectra of the double and single molecules of formic acid. *J. Chem. Phys.*, 6: 531-534 (1938); *C.A.*, 32: 82-89. SpVi, Sy

BORDNER, E. R.

See RANK, D. H.; WHITMORE, F. C.

BORGHS, J.

See ITTERBEEK, A. van

BOROCCO, A. L.

- (B-187) Deuterium and heavy water. A review. *Rev. chim. ind. Paris*, 46: 322-329 (1937); *C.A.*, 32: 1528. Ge
- (B-188) Dissociation pressures of hydrides and deuterides of rubidium and cesium. *Compt. rend.*, 206: 1117-1118 (1938); *C.A.*, 32: 4055. ThPh

See also HACKSPILL, L.

BOSSCHIETER, G.

- (B-189) The infrared association band of a heavy alcohol. *J. Chem. Phys.*, 5: 992 (1937); *C.A.*, 32: 1181. SpVi

See also BARKER, E. F.

BOSWORTH, R. C. L.

- (B-190) The properties of hydrogen films on tungsten by the method of contact potentials. *Proc. Cambridge Phil. Soc.*, 33: 394-402 (1937); *C.A.*, 31: 8281. AdG

BOTTOMLEY, G. H., CAVANAGH, B., and POLANYI, M.

- (B-191) Enzyme catalysis of the exchange of deuterium with water. *Nature*, 136: 103-104 (1935); *C.A.*, 29: 6611. KiH

BOUGHTON, W. A.

- (B-192) Naming hydrogen isotopes. *Science*, 79: 159-160 (1934); *C.A.*, 28: 2264. No

BOUTARIC, A.

- (B-193) Heavy hydrogen, or deuterium, and heavy water. A review. *Génie civil*, 104: 444-446 (1934); *C.A.*, 28: 7151. Ge

BOWDEN, E.

See HALL, N. F.

BOWDEN, F. P., and KENYON, H. F.

(B-194) Overpotential of the hydrogen isotopes. *Nature*, 135: 105 (1935); *C.A.*, 29: 2457. *EcO*, *SeEl*

BOWMAN, P. L., BENEDICT, W. S., and TAYLOR, H. S.

(B-195) Preparation and properties of benzene-d₆. *J. Am. Chem. Soc.*, 57: 960 (1935); *C.A.*, 29: 4336. *Me*, *Sy*

BRADLEY, C. A., Jr.

See also McKELLAR, A.

BRADLEY, C. A., Jr., and McKELLAR, A.

(B-196) The photographic infrared absorption spectrum of monodeuterioacetylene. *Phys. Rev.*, 46: 236 (1934); *C.A.*, 28: 6632. *SpVi*

(B-197) Absorption of acetylene and dideuterioacetylene (acetylene-d₂) in the photographic infrared. *Phys. Rev.*, 47: 914-917 (1935); *C.A.*, 29: 7188. *SpVi*, *Sy*

BRADLEY, C. A., Jr., and UREY, H. C.

(B-198) The relative abundance of hydrogen isotopes in natural hydrogen. *Phys. Rev.*, 40: 889-890 (1932); *C.A.*, 26: 4242. *AbG*

BRADY, O. L.

(B-199) Recent advances in science: general and organic chemistry. A review. *Science Progress*, 29: 102-106 (1934); *C.A.*, 28: 6598. *Bi*, *EqH*, *EqL*, *No*, *SeEl*, *Sy*

(B-200) Recent advances in science: general and organic chemistry. Organic compounds containing deuterium. *Science Progress*, 30: 94 (1935); *C.A.*, 29: 6203. *Sy*

(B-201) Recent advances in science: general and organic chemistry. Fixation of double bonds in Kekulé's benzene formula. *Science Progress*, 31: 493-499 (1937); *C.A.*, 31: 2053. *ElRf*, *MeD*, *Sy*, *ThPh*

(B-202) Recent advances in science: general and organic chemistry. Isotopes. *Science Progress*, 31: 100-103 (1936); *C.A.*, 30: 6248. *Ge*

BRAMLEY, A.

- (B-203) Band spectra measurement of mass. Phys. Rev., 44: 309-310 (1933); C.A., 27: 5641. NuM
(B-204) Theory of the separation of isotopes by thermal or centrifugal methods. Science, 92: 427-428 (1940); C.A., 35: 7825. SeCf, SeDf

See also PATENTS, U.S., BREWER, A. K.

BRAMLEY, A., and BREWER, A. K.

- (B-205) A thermal method for the separation of isotopes. J. Chem. Phys., 7: 553-554 (1939); C.A., 33: 6714. SeDf

BRANDT, W.

- (B-206) Heavy water and its biological significance. A review. Klin. Wochschr., 13: 1009-1012 (1934); C.A., 28: 6734. Bi
(B-207) The biological significance of deuterium. A review. Klin. Wochschr., 14: 521-526 (1935). Bi
(B-208) The effect of deuterium oxide on glucolysis. Klin. Wochschr., 14: 1453 (1935); C.A., 30: 2997. BiC
(B-209) The effect of deuterium oxide on the action of the isolated surviving frog heart. Klin. Wochschr., 14: 1597-1599 (1935); C.A., 30: 2997. BiZ
(B-210) The influence of heavy water on the enzymic digestion of urea by urease. Klin. Wochschr., 16: 27 (1937); C.A., 31: 3511. BiC, KiB
(B-211) The influence of heavy water on the urea hydrolysis by urease. Biochem. Z., 291: 99-104 (1937); C.A., 31: 7902. BiC, KiB

BRANDT, W., and REINDELL, H.

- (B-212) The effect of deuterium oxide on the electrocardiogram of the isolated surviving frog heart. Klin. Wochschr., 15: 260-265 (1936); C.A., 30: 6396. BiZ

BRATTAIN, R. R.

See BARNES, R. B.

BRATU, E.

See ABEL, E.

BRATZLER, K.

See EUCKEN, A.; SACHSSE, H.

BRAUER, G.

See BEUTLER, H.

BREIT, G., and CONDON, E. U.

(B-213) Photoelectric effect of the deuteron. Phys. Rev., 49: 904-911 (1936). NuR

BREIT, G., STEHN, J. R., and CONDON, E. U.

(B-214) Correction to the photoelectric effect of the deuteron. Phys. Rev., 51: 56 (1937). NuR

BRESCIA, F.

(B-215) Calculation of the dissociation constant of weak acids in H_2O - D_2O mixtures. J. Am. Chem. Soc., 60: 2811-2813 (1938); C.A., 33: 454. EqL, KiL

(B-216) The prediction of rate constants from equilibrium data for reactions in D_2O - H_2O mixtures. J. Chem. Phys., 7: 310-313 (1939); C.A., 33: 5267. EqL, KiL

See also La MER, V. K.

BRESCIA, F., and La MER, V. K.

(B-217) Kinetics of the hydrolysis of ethyl orthoformate in D_2O - H_2O mixtures. J. Am. Chem. Soc., 60: 1962-1967 (1938); C.A., 32: 8896. EqL, KiL

(B-218) The energy and entropy of activation of the hydrolysis of ethyl orthoformate in deuterium oxide. J. Am. Chem. Soc., 62: 612-614 (1940); C.A., 34: 2688. ThF

(B-219) Calculation of equilibrium values and rate constants for reactions in D_2O - H_2O mixtures. Ann. N. Y. Acad. Sci., 39, Art. 5: 395-399 (1940); C.A., 35: 2775. EqL, KiL

BRESCIA, F., La MER, V. K., and NACHOD, F. C.

(B-220) The temperature dependence of the dissociation constant of deuterioacetic acid. J. Am. Chem. Soc., 62: 614-617 (1940); C.A., 34: 2683. EqL, KiL, ThSo

BRESLER, S. E., and LANDERMAN, A.

(B-221) Viscosity of liquid methane and deuteriomethane. J. Exptl. Theoret. Phys., U.S.S.R., 10: 250-251 (1940); C.A., 34: 7679. MeV

BREUER, F. W.

(B-222) Chloroform-d (deuteriochloroform). J. Am. Chem. Soc., 57: 2236-2237 (1935); C.A., 30: 78. ElRf, MeD, SpVi, Sy, ThPh

(B-223) Tetrachloroethane-1,2-d₂(*sym*-dideuteriotetrachloroethane). J. Am. Chem. Soc., 58: 1289-1290 (1936); C.A., 30: 5936. Me, Sy, ThPh

BREUSCH, F., and HOFER, E.

(B-224) The ratio of heavy water to light water in the organism. Klin. Wochschr., 13: 1815-1816 (1934); C.A., 29: 5132. AbO

BREWER, A. K.

See BRAMLEY, A.; PATENTS, U.S.

BRICKWEDDE, F. G.

(B-225) Interesting applications of deuterium. J. Wash. Acad. Sci., 25: 157-166 (1935); C.A., 29: 3883. Bi, El, EqG, EqH, EqL, In, Me, So, Th

BRICKWEDDE, F. G., and SCOTT, R. B.

(B-226) Some physical properties of liquid and solid HD. Phys. Rev., 55: 672 (1939); C.A., 34: 4948. ThPh

BRICKWEDDE, F. G., SCOTT, R. B., and TAYLOR, H. S.

(B-227) Difference in vapor pressures of ortho- and para-deuterium. J. Chem. Phys., 3: 653-660 (1935); C.A., 30: 365. ThPh

(B-228) Difference in vapor pressures of ortho- and para-deuterium. J. Research Natl. Bur. Standards, 15: 463-475 (1935). ThPh

BRICKWEDDE, F. G., SCOTT, R. B., UREY, H. C., and WAHL, M. H.

(B-229) The vapor pressure of deuterium. Phys. Rev., 45: 565 (1934). ThPh

BRICKWEDDE, L. H., and VINAL, G. W.

(B-230) Electromotive force of saturated Weston standard cells containing deuterium oxide. J. Research Natl. Bur. Standards (research paper No. 1094), 20: 599-605 (1938); C.A., 32: 6556. EcP

(B-231) The electromotive force of saturated Weston standard cells containing D₂O. Phys. Rev., 57: 1064-1065 (1940); C.A., 35: 4690. EcP, SoH

BRICKWEDDE, L. H., and VINAL, G. W. (Continued)

- (B-232) Relation of electromotive force to the concentration of D_2O in saturated standard cells. J. Research Natl. Bur. Standards (research paper No. 1435), 27: 479-489 (1941); C.A., 36: 972. EcP, ThSo

BRIDGMAN, P. W.

- (B-233) The pressure-volume-temperature relations of the liquid, and the phase diagram of heavy water. J. Chem. Phys., 3: 597-605 (1935); C.A., 29: 7771. ThD, ThPh

BRINKLEY, S. R., Jr.

See CRAWFORD, B. L., Jr.

BRINKMAN, H. C.

- (B-234) The viscosities of liquid deuterium and hydrogen. Physica, 7: 447-448 (1940); C.A., 37: 1314. MeV

BRISCOE, H. V. A.

See ANDERSON, J. S.; EMELEUS, H. J.; EVANS, E. M.; JAMES, F. W.; KING, A.; ROBERTS, E. R.

BROAD, D. N., and FOSTER, A. G.

- (B-235) Comparative isothermals of water and deuterium oxide on porous solids. J. Chem. Soc., 1945: 372-375; C.A., 39: 4786. AdG

BROCKWAY, L. O.

See KARLE, J.

BRODSKII, A. I. (BRODSKY, A. E.)

- (B-236) Reaction of the exchange of hydrogen for deuterium. IV. Equilibrium constants of the exchange reactions in solution. J. Phys. Chem. U.S.S.R., 9: 755-762 (1937); C.A., 31: 8335. EqL
- (B-237) The exchange of hydrogen with deuterium in solution. Trans. Faraday Soc., 33: 1180-1185 (1937); C.A., 31: 8335. EqL
- (B-238) Theory of the separation of mixtures and its application to the thermodiffusion method. Acta Physicochim. U.R.S.S., 13: 294-304 (1940); C.A., 35: 1679. SeDf
- (B-239) A comparison of the methods of preparing heavy water. J. Applied Chem. U.S.S.R., 13: 670-675 (1940); C.A., 35: 3133. Se

BRODSKII, A. I. (BRODSKY, A. E.) (Continued)

See also SHERSHEVER, Z. M.; SLUTSKAYA, M. M.; ZAN'-KO, A. A.

BRODSKII, A. I., ALEKSANDROVICH, V. A., SLUTSKAYA, M. M., and SHELUD'KO, M. K.

(B-240) Concentrating heavy water. *Compt. rend. acad. sci. U.R.S.S.*, 3: 615-617 (1934); *C.A.*, 29: 2077. SeEl

(B-241) Concentrating heavy water. *Ber. Inst. Physik. Chem. Akad. Wiss. Ukr. S.S.R.*, 5: 151-154 (in German 155-157) (1936); *C.A.*, 32: 3685. SeEl

BRODSKII, A. I., and RADCHENKO, N. P.

(B-242) Isotopic composition of arctic seas and ices. *Acta Physicochim. U.R.S.S.*, 13: 145-146 (1940); *C.A.*, 35: 1677. AbG, AnDn

BRODSKII, A. I., RADCHENKO, N. P., and SMOLENSKAYA, B. L.

(B-243) Isotopic composition of arctic waters, ices, and glaciers. *J. Phys. Chem. U.S.S.R.*, 13: 1494-1501 (1939); *C.A.*, 35: 353. AbG

BRODSKII, A. I., and SCARRE, O. C.

(B-244) Exchange reactions of hydrogen with deuterium. I. Exchange in carboxyl groups of succinic acid and in hydroxyl groups of hydroquinone. *Acta Physicochim. U.R.S.S.*, 2: 603-610 (1935); *C.A.*, 29: 6821. EqL

BRODSKII, A. I., SCARRE, O. C., DONZOVA, E. I., and SLUTSKAYA, M. M.

(B-245) Isotope comparison of snow and mountain water. *Acta Physicochim. U.R.S.S.*, 7: 611-620 (1937); *C.A.*, 32: 4024. AbG, AnDn

BRODSKII, A. I., and SKRINNIKOVA, N. P.

(B-246) Effect of electrolyte on the concentration of heavy water. *Acta Physicochim. U.R.S.S.*, 2: 809-810 (1935); *C.A.*, 30: 5485. SeEl

BRODSKII, A. I., and SLUTSKAYA, M. M.

(B-247) Hydrogen-deuterium exchange in acetone. *J. Phys. Chem. U.S.S.R.*, 11: 278-279 (1938); *C.A.*, 33: 4112. EqL

BRODSKII, A. I., and ZAN'KO, A. A.

- (B-248) Absorption spectrum of copper sulfate in heavy water. J. Phys. Chem. U.S.S.R., 8: 953-954 (1936); C.A., 31: 2098. ElCl

BRODSKY, A. E.

See BRODSKII, A. I.

BROOKS, H.

- (B-249) Rotational magnetic moments of H_2 , HD and D_2 . Phys. Rev., 59: 925 (1941); C.A., 36: 3433. ElD

BROOKS, J., and MORAN, T.

- (B-250) The state of water in tissues. The uptake of water by gelatin. Dept. Sci. Ind. Research Brit. Rept. Food Investigation Board, 1934: 28-29 (1935); C.A., 30: 1878. KiB

BROOKS, S. C.

- (B-251) The permeability of erythrocytes to deuterium oxide (heavy water). J. Cellular Comp. Physiol., 7: 163-171 (1935); C.A., 30: 1405. BiZ
- (B-252) Osmotic effects of deuterium oxide (heavy water) on living cells. Science, 86: 497-498 (1937); C.A., 32: 2554. BiZ

BROWN, G. B.

See VIGNEAUD, V. du

BROWN, G. W.

See BONHOEFFER, K. F.

BROWN, R. S., BARNES, W. H., and MAASS, O.

- (B-253) Measurement of some thermal properties of deuterium oxide, and their interpretation. Can. J. Research, 12: 699-701 (1935); C.A., 29: 5729. ThPh
- (B-254) A note on the specific heats of liquid deuterium oxide. Can. J. Research, 13B: 167-169 (1935); C.A., 30: 372. ThPh

BROWN, W. G.

See also KHARASCH, M. S.; WIDIGER, A. H.

BROWN, W. G., and DAGGETT, A. F.

- (B-255) Plant for the production of heavy water. J. Chem. Phys., 3: 216-218 (1935); C.A., 29: 3608. SeEl

BROWN, W.G., and EBERLY, K.

- (B-256) Hydrogen exchange reactions of esters in relation to reactivity in condensation reactions. *J. Am. Chem. Soc.*, 62: 113-115 (1940); C.A., 34: 1303. EqL

BROWN, W.G., KHARASCH, M.S., and SPROWLS, W.R.

- (B-257) Exchange reactions in deuterioalcohol. II. *J. Org. Chem.*, 4: 442-455 (1939); C.A., 34: 390. EqL

BROWN, W.G., and LETANG, N.J.

- (B-258) Hydrogen exchange reactions of aromatic tertiary amines. *J. Am. Chem. Soc.*, 63: 358-361 (1941); C.A., 35: 2137. EqL

BROWN, W.G., MIGHTON, C.J., and SENKUS, M.

- (B-259) Raman spectra of some hydrocarbons containing tertiary C-D linkages. *J. Org. Chem.*, 3: 62-75 (1938); C.A., 32: 7822. SpVi, Sy

BRUN, J.

See also TRONSTAD, L.

BRUN, J., and TRONSTAD, L.

- (B-260) Some germination experiments with peas in heavy water. *Kgl. Norske Videnskab. Selskabs Forh.*, 7: 171-173 (1935); C.A., 29: 5137. BiB

BRUNI, G.

- (B-261) Possibility of separating heavy water by fractional freezing. *J. Am. Chem. Soc.*, 56: 2013-2014 (1934); C.A., 28: 7152. SeCr
- (B-262) The possibility of separating D₂O from water by fractional crystallization. *Atti accad. nazl. Lincei*, 20: 73-75 (1934); C.A., 29: 404. SeCr
- (B-263) New method of separation of heavy water. IX Congr. intern. quím. pura aplicada, 2: 526-528 (1934); C.A., 29: 7180. SeCr

BRUNI, G., and STRADA, M.

- (B-264) New methods for separating heavy water from ordinary water. *Atti accad. nazl. Lincei*, 19: 453-458 (1934); C.A., 28: 6627. SeDf

BRUYN, P. de

See ITTERBEEK, A. van

BRUYNE, J. M. A. de, and SMYTH, C. P.

(B-265) The dipole moment of deuterioammonia (ammonia-d₃). J. Am. Chem. Soc., 57: 1203-1205 (1935); C.A., 29: 5711. ElD, ThPh

BRYAN, H. F.

See MACHT, D. I.

BUCHANAN, C.

(B-266) Influence of solvents and of other factors on the rotation of optically active compounds. XXXIV. Influence of water and of deuterium oxide. J. Chem. Soc., 1937: 581-584; C.A., 31: 4875. ElRo, SoH

(B-267) Deuterium and optical activity. A review. Chemistry & Industry, 1938: 748-751; C.A., 32: 8357. ElRo

BUECHNER, A.

See TAMMANN, G.

BUENO, O. G.

(B-268) Heavy water. A review. Politecnica, Quito, Ecuador, 1: 306-312 (1936); C.A., 32: 4055. Ge

BURNHAM, J.

See CROSS, P. C.

BURSHTIN, R. K. (BURSTEIN, R. K.)

(B-269) Determination of the concentration of deuterium in mixtures with hydrogen by means of heat conductivities. J. Phys. Chem. U.S.S.R., 9: 870-874 (1937); C.A., 31: 8343. AnTh

(B-270) Determination of the concentration of deuterium in mixtures with hydrogen by means of heat conductivities. Acta Physicochim. U.R.S.S., 6: 815-822 (1937); C.A., 32: 8228. AnTh

(B-271) Exchange between light and heavy hydrogen on charcoal. J. Phys. Chem. U.S.S.R., 12: 185-188 (1938). Acta Physicochim. U.R.S.S., 8: 857-863 (1938); C.A., 33: 4854. AdG, EqG

BURSHTEIN, R. K. (BURSTEIN, R. K.) (Continued)

- (B-272) Para-ortho conversion of hydrogen and the exchange reaction between light and heavy hydrogen on charcoal. J. Phys. Chem. U.S.S.R., 14: 1195-1199 (1940); C.A., 35: 3881. AdG, EqG

BURTON, M.

- (B-273) The mechanism of photolysis of deuterioammonia. J. Chem. Phys., 6: 680-681 (1938); C.A., 33: 41. KiG

BURWELL, R. L., Jr., HUMMEL, F., and WALLIS, E. S.

- (B-274) The preparation and optical rotation of *d*-deuteriomethylmethylphenylmethane. J. Org. Chem., 1: 332-335 (1936); C.A., 31: 1776. ElRo, Sy

BUSHEY, M. S.

See VISSCHER, M. B.

BUSWELL, A. M., DEITZ, V., and RODEBUSH, W. H.

- (B-275) The effect of hydrogen bond formation on the fundamental frequency of the hydroxyl radical. J. Chem. Phys., 5: 84 (1937); C.A., 31: 945. SpVi

BUTLER, J. A. V.

- (B-276) The electrolytic separation of hydrogen and deuterium and the catalyzed exchange reaction $\text{HD} + \text{H}_2\text{O} \rightleftharpoons \text{H}_2 + \text{HDO}$. A review. Z. Elektrochem., 44: 55-62 (1938); C.A., 32: 2410. EqH, SeEl

See also HORNEL, J. C.; MARTIN, D. C.; NELSON, W. E.; ORR, W. J. C.

CABRERA, B., and FAHLENBRACH, H.

- (C-1) Diamagnetism of heavy water in the liquid and solid states. *Anales fís. y quím. Madrid*, 32: 538-542 (1934); *C.A.*, 28: 6038. ElMg
- (C-2) The diamagnetism of liquid and solid heavy water and its temperature curve. *Naturwissenschaften*, 22: 417 (1934); *C.A.*, 28: 7088. ElMg

CAIQUIL, G.

See GODCHOT, M.

CALAS, R.

See GODCHOT, M.

CALDWELL, M. L., and DOEBBELING, S. E.

- (C-3) The influence of heavy water upon amylase formation in barley. *J. Biol. Chem.*, 123: 479-483 (1938); *C.A.*, 32: 4615. BiC, KiB

CALDWELL, M. L., DOEBBELING, S. E., and MANIAN, S. H.

- (C-4) Influence of heavy water upon the activity and upon the stability of pancreatic amylase. *J. Am. Chem. Soc.*, 58: 84-87 (1936); *C.A.*, 30: 1406. BiC

CALDWELL, M. L., DOEBBELING, S. E., and WICKLEN, F. C. von

- (C-5) Influence of heavy water on the activities and on the stabilities of the amylases of barley and of malted barley. *J. Am. Chem. Soc.*, 61: 125-127 (1939); *C.A.*, 33: 1772. BiC

CALEY, E. R.

See TAYLOR, H. S.

CALVIN, M.

- (C-6) Platinum electrode as a catalyst for the activation of hydrogen. *Trans. Faraday Soc.*, 32: 1428-1436 (1936); *C.A.*, 31: 26. EcQ, KiH
- (C-7) Homogeneous catalytic hydrogenation. *J. Am. Chem. Soc.*, 61: 2230-2234 (1939); *C.A.*, 33: 8095. KiH

CALVIN, M., and DYAS, H. E.

- (C-8) The platinum electrode as a catalyst for the activation of hydrogen. II. Trans. Faraday Soc., 33: 1492-1495 (1937); C.A., 32: 1554. EcO, KiH

CAMERON, D. M., SEARS, W. C., and NIELSEN, H. H.

- (C-9) The infrared absorption by hydrogen selenide, deuterium selenide and deuterium hydrogen selenide. J. Chem. Phys., 7: 994-1002 (1939); C.A., 34: 322. SpVi

CARDINALI, M.

- (C-10) Crystallization of sodium chloride in the presence of D₂O. Boll. soc. ital. biol. sper., 13: 923-925 (1938); C.A., 33: 6122. EcC, MeV, SoH, ThPh

CARISSIMI, M.

See MANZONI-ANSIDEI, R.

CARR, C. W.

See VISSCHER, M. B.

CARTWRIGHT, C. H.

- (C-11) Extreme infrared absorption of D₂O, ice and D₂O in dioxane. Nature, 136: 181 (1935); C.A., 29: 7189. SpVi
- (C-12) Hindered rotation in liquid H₂O and D₂O. Phys. Rev., 49: 470-471 (1936); C.A., 30: 3324. ElSc, SpVi

CARTWRIGHT, C. H., and ERRERA, J.

- (C-13) Atomic polarization and absorption of liquids in the remote infrared. Acta Physicochim. U.R.S.S., 3: 649-684 (1935); C.A., 30: 4091. ElRf, SpVi

CASIMIR, H. B. G.

- (C-14) Ortho-para conversion of deuterium and the electric quadrupole moment of the deuteron. Physica, 7: 169-176 (1940); C.A., 34: 4655. NuMg

CASSELMAN, A. L.

- (C-15) The infrared absorption spectrum of water, containing protium and deuterium. Phys. Rev., 45: 221-222 (1934); C.A., 28: 2616. SpVi

CASTANEDA, A. F., and CLEMENTE, A.

- (C-16) Heavy water content of the Manila water supply and of the

CASTANEDA, A. F., and CLEMENTE, A. (Continued)

artesian water of the University of the Philippines. Univ. Philippines Nat. and Applied Sci. Bull., 7: 19-23 (1939); C.A., 34: 559. AbG, SeDs, SeEl

CASTELLANI, E.

(C-17) The effect of heavy water at low concentrations on some microorganisms. Boll. sez. ital. soc. intern. microbiol., 7: 396-400 (1935); C.A., 30: 1813. BiB

CATLIN, W. E.

See KEIL, H. L.

CAVALLARO, L., and LUCCHI, E.

(C-18) The absorption of indene and 1-deuterioindene at high radio frequencies. Ricerca sci. e ricostruz., 8, II: 231-233 (1937); C.A., 34: 5754. ElD

CAVALLARO, L., and MANZONI-ANSIDEI, R.

(C-19) The absorption of N-deuteriopyrrole at high radio frequencies. Ricerca sci. e ricostruz., 8, II: 228-230 (1937); C.A., 34: 5754. ElD

CAVANAGH, B.

See also BOTTOMLEY, G. H.

CAVANAGH, B., HORIUCHI, J., and POLANYI, M.

(C-20) Enzyme catalysis of the ionization of hydrogen. Nature, 133: 797 (1934); C.A., 28: 5085. EqL

CAVANAGH, B., and RAPER, H. S.

(C-21) Deuterium as an indicator in fat metabolism. Nature, 137: 233-234 (1936); C.A., 30: 3871. InBi

CERNIAEV, J. (CERNJAIEV, V., CERNIAJEV, V.)

See CHERNYAEV, V.

CERVONE, S.

See PESCE, B.

CHAMBERLAIN, K., and CUTTER, H. B.

(C-22) New lines in the electronic band spectrum of neutral OH. Phys. Rev., 43: 771-772 (1933); C.A., 27: 3880. SpEl

CHAMBERLAIN, K., and CUTTER, H. B. (Continued)

- (C-23) New bands in the electronic band spectrum of neutral OH. Phys. Rev., 44: 927-930 (1933); C.A., 28: 1271. SpEl

CHAMPETIER, G.

- (C-24) Laboratory apparatus for the electrolytic concentration of the isotope 2 of hydrogen. Bull. soc. chim. France (5), 2: 162-167 (1935); C.A., 29: 5025. SeEl
- (C-25) Hydration of chromic chloride in heavy water. Compt. rend., 201: 1118-1120 (1935); C.A., 30: 979. EcC, ThPh
- (C-26) Heavy hydrogen, the isotope of hydrogen and heavy water. A review. Bull. soc. encour. ind. natl., 135: 237-249 (1936); C.A., 30: 5496. Ab, Bi, ElRf, EqH, MeD, No, Se, ThPh
- (C-27) The separation of isotopes. A review. Bull. soc. chim. France (5), 3: 1701-1727 (1936); C.A., 31: 1695. Ab, EqH, Se
- (C-28) Deutérium et composés de deutérium. Tables annuelles de constantes. Nr. 1. 80pp., Hermann & Cie, Paris, 1938; C.A., 32: 2823. Ge

See also ABADIE, P.; PLANTEFOL, L.

CHAMPETIER, G., FREYMAN, R., and TA, Y.

- (C-29) The absorption spectrum of heavy water in the near infrared. Bull. soc. chim. (5), 5: 929-931 (1938); C.A., 32: 8933. SpVi

CHAMPETIER, G., and VIALARD, R.

- (C-30) Penetration of water into the cellulose lattice. Interchange of H and D between cellulose and heavy water. Compt. rend., 205: 1387-1388 (1937); C.A., 32: 1543. EqH
- (C-31) Exchange reaction of cellulose and heavy water. Hydration of cellulose. Bull. soc. chim. France (5), 5: 1042-1048 (1938); C.A., 32: 8767. EqH

CHANDLER, J. P.

See SIMMONDS, S.

CHANG, T. L.

- (C-32) Recent researches on heavy water. Science, 100: 29-30 (1944); C.A., 38: 5142. KiL, MeD, SoH, Sy, ThSo

CHANG, T. L. (Continued)

- (C-33) Distribution of I between D_2O and CCl_4 . J. Am. Chem. Soc., 66: 1940-1941 (1944); C.A., 39: 453. ThPh

See also RIESENFELD, E. H.

CHANG, T. L., and CHIEN, J. Y.

- (C-34) Maximum difference between the densities of ordinary and heavy water. J. Am. Chem. Soc., 63: 1709-1711 (1941); C.A., 35: 5008. MeD
- (C-35) The temperature of density maximum of heavy water. J. Chinese Chem. Soc., 8: 74-75 (1941); C.A., 37: 11. MeD

CHANG, T. L., and CHU, T. C.

- (C-36) Solubility of sodium chloride in mixtures of protium and deuterium oxides. Z. physik. chem., A184: 411-415 (1939); C.A., 34: 306. SoH

CHANG, T. L., and WEI, Y. C.

- (C-37) Change of velocity of reaction between hydrogen peroxide and hydriodic acid through the displacement of protium by deuterium atoms. J. Chinese Chem. Soc., 7: 138-143 (1940); C.A., 35: 5022. KiL

CHERNYAEV, V. (CERNIAEV, J.)

- (C-38) The influence of noble gases on the intensity of lines of hydrogen and deuterium Balmer series. Compt. rend. acad. sci. U.R.S.S., 19: 243-248 (1938); C.A., 32: 7818. SpA
- (C-39) Determination of Rydberg constants for hydrogen and deuterium. Compt. rend. acad. sci. U.R.S.S., 20: 347-350 (1938); C.A., 33: 2411. SpA
- (C-40) Wave-length measurements of deuterium and hydrogen Balmer lines. I. Compt. rend. acad. sci. U.R.S.S., 20: 431-433 (1938); C.A., 33: 3689. SpA
- (C-41) The influence of noble gases on the intensity of lines of hydrogen and deuterium Balmer series. II. Compt. rend. acad. sci. U.R.S.S., 20: 435-436 (1938); C.A., 33: 3689. SpA

See also FRISH, S. E.

CHESLEY, L. C.

See SUGIURA, K.; WOODARD, H. Q.

CHIEN, J. Y.

See CHANG, T. L.

CHILDS, W. H. J., and JAHN, H. A.

(C-42) Absorption spectrum of heavy methane (CH_3D) in the photographic infrared. *Nature*, 138: 285 (1936); *C.A.*, 30: 7033. SpVi

(C-43) The spectrum of monodeuteriomethane (methane-d) in the photographic infrared. I. Preparation of the gas, and measurements of a simple band at 9021 cm^{-1} . *Proc. Roy. Soc. London*, A169: 428-437 (1939); *C.A.*, 33: 3693. SpVi, Sy

CHIPLONKAR, V. T. (CHIPLUNKER, V. T.)

(C-44) The Raoult depression in ordinary and heavy water. *Indian J. Phys.* 10: 275-276 (1936); *C.A.*, 31: 1277. ThSo

(C-45) The relative efficiencies of the multistage and one-stage process in the electrolytic preparation of heavy water. *Proc. Indian Acad. Sci.*, 4A: 463-467 (1936); *C.A.*, 31: 5641. SeEl

CHITANI, T.

See TITANI, T.

CHITTOCK, C.

(C-46) Heavy hydrogen. *School Sci. Rev.*, 16: 132 (1934); *C.A.*, 28: 7151. Ge

CHITTUM, J. P.

See also La MER, V. K.

CHITTUM, J. P. and La MER, V. K.

(C-47) Conductance of salts in H_2O - D_2O mixtures. *J. Am. Chem. Soc.*, 59: 2425-2430 (1937); *C.A.*, 32: 1546. EcC, EqL, MeV

CHRISTIANSEN, W. N., CRABTREE, R. W., and LABY, T. H.

(C-48) Density of light water: ratio of deuterium to hydrogen in rain water. *Nature*, 135: 870 (1935); *C.A.*, 29: 5322. AbG, MeD

CHRISTY, R. F., and KUSAKA, S.

(C-49) Electric quadripole moment of the deuteron. *Phys. Rev.*, 55: 665 (1939); *C.A.*, 33: 4120. NuMg

CHU, T. C.

See CHANG, T. L.

CIGNOLI, F.

(C-50) Heavy water: a review. *Semana méd.* Buenos Aires, 1: 2068-2071 (1934); C.A., 28: 6061. Ge

CITARDA, A.

See INDOVINA, R.

CLAES, A.

See ITTERBEEK, A. van

CLARK, A., and RODEBUSH, W. H.

(C-51) The OD⁺ bands. *J. Am. Chem. Soc.*, 57: 228 (1935); C.A., 29: 1323. SpVi

CLARK, C. H. D., and STOVES, J. L.

(C-52) Calculation of equilibrium internuclear distance for diatomic hydrogen, hydrides, and deuterides in ground and excited states. *Phil. Mag.*, 27: 389-403 (1939); C.A., 33: 5245. SpEl

CLAUSSEN, W. H., and HILDEBRAND, J. H.

(C-53) Vapor pressures of hydrogen and deuterium fluorides. *J. Am. Chem. Soc.*, 56: 1820 (1934); C.A., 28: 5736. ThPh

CLAY, J.

(C-54) Heavy hydrogen and heavy water. A review. *Ingenieur*, Utrecht, 50A: 220-223 (1935); C.A., 30: 3715. Ge

CLEMENTE, A.

See CASTANEDA, A. F.

CLEMO, G. R., and McQUILLEN, A.

(C-55) Experiments on hexadeuteriobenzene (benzene-d₆) I. *J. Chem. Soc.*, 1935: 851-855; C.A., 29: 5820. Sy

(C-56) Micropycnometer method for density determinations. *J. Chem. Soc.*, 1935: 1220; C.A., 29: 7717. MeD

(C-57) Octadeuterionaphthalene. *J. Chem. Soc.*, 1935: 1325; C.A., 29: 7969. Sy

(C-58) Molecular dissymmetry due to symmetrically placed hydrogen and deuterium. I. The resolution of α -pentadeuterophenylbenzylamine. *J. Chem. Soc.*, 1936: 808-810; C.A., 30: 5950. ElRo, Sy

CLEMO, G. R., RAPER, R., and ROBSON, A. C.

- (C-59) Optical isomerism due to symmetrically placed hydrogen and deuterium atoms. II. J. Chem. Soc., 1939: 431-435; C.A., 33: 4230. ElRo

CLEMO, G. R., and ROBSON, A. C.

- (C-60) Polymerization of dideuteroacetylene. J. Chem. Soc., 1939: 429-430; C.A., 33: 4189. KiH, Sy
- (C-61) Molecular dissymmetry due to symmetrically placed hydrogen and deuterium. (II) The α -pentadeuteriophenylbenzylamine problem. J. Chem. Soc., 1939: 1960-1961; C.A., 34: 1628. ElRo
- (C-62) Molecular dissymmetry due to symmetrically placed hydrogen and deuterium. III. The attempted resolution of 4,4'-dibromo-2,3,5,6-tetradeuteriobenzohydrilamine. A method for the determination of deuterium in organic compounds. J. Chem. Soc., 1942: 370-374; C.A., 36: 5160. AnEl, ElRo
- (C-63) Synthesis of heavy *dl*-adrenaline. J. Chem. Soc., 1942: 395-397; C.A., 36: 5793. BiZ, EqQ, Sy

CLUSIUS, K.

- (C-64) Two lecture experiments with liquid hydrogen. Physik. Z., 35: 929-930 (1934); C.A., 29: 2035. ThPh
- (C-65) Vapor pressure difference of the ortho and para modifications of the hydrogen isotopes. Z. physik. Chem., B29: 159-161 (1935); C.A., 29: 7141. ThPh
- (C-66) Thermal properties of D₂ and its compounds. A review. Z. Elektrochem., 44: 21-31 (1938); C.A., 32: 2410. MeD, ThF, ThPh

See also BARTHOLOMÉ, E.; FRANK, A.; GRAFE, D.; HOELEMANN, P.; KRUIS, A.

CLUSIUS, K., and BARTHOLOMÉ, E.

- (C-67) The rotation heat of the molecules HH² and H₂², and the nuclear spin of H² atoms. Z. Elektrochem., 40: 524-529 (1934); C.A., 28: 6036. EqG, NuS, ThF
- (C-68) The rotational heat capacity of HH² and H₂², nuclear spin, and statistics of the deuteron. Naturwissenschaften, 22: 297 (1934); C.A., 28: 7152. NuS, ThF
- (C-69) Measurements on condensed heavy hydrogen. Naturwissenschaften, 22: 526-527 (1934); C.A., 29: 672. ThPh

CLUSIUS, K., and BARTHOLOMÉ, E. (Continued)

- (C-70) The properties of condensed heavy hydrogen. *Physik. Z.* 35: 969-971 (1934). *Z. tech. Physik*, 15: 545-547 (1934) C.A., 29: 2418. ThF, ThPh
- (C-71) Heat of rotation of the molecule H^1H^2 (isohydrogen). *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 1-14 (1934). ThF
- (C-72) The heat of rotation of the molecule H_2^2 (dihydrogen) and the nuclear spin of the H^2 atom. *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 15-21 (1934) NuS, ThF
- (C-73) The specific heats and heat of fusion of condensed heavy hydrogen. *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 29-39 (1934); C.A., 29: 3224 ThF, ThPh
- (C-74) The heat of vaporization of deuterium. *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 49-56 (1935); C.A., 29: 6828. ThPh
- (C-75) The difference between the internal pressures of the condensed hydrogen isotopes. *Z. Elektrochem.*, 41: 487-488 (1935); C.A., 29: 7133. ThF
- (C-76) Heat of rotation of heavy ortho-hydrogen. *Z. physik. Chem.*, B29: 162-169 (1935); C.A., 29: 7169. ThF
- (C-77) Caloric and thermal properties of condensed heavy hydrogen. *Z. physik. Chem.*, B30: 237-257 (1935); C.A., 30: 946. ThF, ThPh
- (C-78) Entropy of heavy hydrogen. *Z. physik. Chem.*, B30: 258-264 (1935); C.A., 30: 945. ThF

CLUSIUS, K., and DICKEL, G.

- (C-79) The separating-tube process for liquids. *Naturwissenschaften*, 27: 148-149 (1939); C.A., 33: 5705. SeDf
- (C-80) The separation tube. I. Principles of a new method of gas and isotope separation by thermal diffusion. *Z. physik. Chem. B44*: 397-450 (1939); C.A., 34: 673. SeDf

CLUSIUS, K., and FRANK, A.

- (C-81) A lecture experiment on the maximum density of light and heavy water. *Z. physik. chem. Unterricht.*, 52: 1-2 (1939); C.A., 33: 9059. MeD

CLUSIUS, K., and GUTSCHMIDT, H.

- (C-82) The lower explosion limit of mixtures of heavy hydrogen and air. *Naturwissenschaften*, 22: 693 (1934); C.A., 29: 683. MeD

CLUSIUS, K., and GUTSCHMIDT, H. (Continued)

- (C-83) Flames from light and heavy hydrogen. Z. Elektrochem., 42: 498 (1936); C.A., 30: 7004. SeCh

CLUSIUS, K., KOELSCH, W., and WALDMANN, L.

- (C-84) Isotope separation and the mechanism of combustion in ascending hydrogen-deuterium flames. Z. Elektrochem., 47: 820; Z. physik. Chem., A189: 131-162 (1941); C.A., 36: 4378. SeCh

CLUSIUS, K., and KOWALSKI, H.

- (C-85) The separation of molecules of equal masses in a (diffusion) tube. Z. Elektrochem., 47: 819 (1941); C.A., 36: 4378. SeDf

CLUSIUS, K., KRUIS, A., and SCHANZER, W.

- (C-86) The transitions of some deuterio-ammonium salts. Z. anorg. Chem., 236: 24-36 (1938); C.A., 32: 4417. ThPh

CLUSIUS, K., and POPP, L.

- (C-87) The heat capacity, heat of fusion, and heats of transition of the condensed gases CD_4 and CH_3D . Z. physik. Chem., B46: 63-81 (1940); C.A., 35: 966. ThPh

CLUSIUS, K., POPP, L., and FRANK, A.

- (C-88) The transitions of solid methane-d and methane-d₄. The entropy relations of methane-d and of deuterium hydride, HD. Physica, 4: 1105-1116 (1937); C.A., 32: 3227. ThF, ThPh

CLUSIUS, K., and SCHANZER, W.

- (C-89) Mechanism of the photolysis of acetic acid by means of quartz ultraviolet light. Ber., 75B: 1795-1799 (1942); C.A., 38: 2567. KiP
- (C-90) Electrolysis of fatty acids containing D. V. Mechanism of CH_4 formation in the electrolysis of AcOH. Z. physik. Chem., A192: 273-291 (1943); C.A., 38: 2275. KiL

CLUSIUS, K., and WEIGAND, K.

- (C-91) Melting curves of the gases, A, Kr, Xe, CH_4 , CH_3D , CD_4 , C_2H_4 , C_2H_6 , COS and PH_3 to 200 atmospheres pressure. The change of volume on melting. Z. physik. Chem., B46: 1-37 (1940); C.A., 35: 947. ThF, ThPh

CLUTTON, R. F., SCHOENHEIMER, R., and RITTENBERG, D.

- (C-92) Protein metabolism. XII. The conversion of ornithine into arginine in the mouse. *J. Biol. Chem.*, 132: 227-231 (1940); *C.A.*, 34: 1360. InBi, Sy

COBB, L. H.

See ANDERSON, J. S.

COBLENTZ, W. W., and STAIR, R.

- (C-93) The infrared absorption spectrum of deuterium-containing stearic acid. *Phys. Rev.*, 49: 869 (1936); *C.A.*, 31: 5677. SpVi

COCHRAN, F. J.

See BARBOUR, H. G.

COCKETT, A. H.

See also FERGUSON, A.

COCKETT, A. H., and FERGUSON, A.

- (C-94) Surface tension of water and heavy water. *Phil. Mag.*, 28: 685-693 (1939); *C.A.*, 34: 1530. MeSt
(C-95) The specific heat of water and heavy water. *Phil. Mag.*, 29: 185-199 (1940); *C.A.*, 34: 3163. ThF

COGAN, D. G.

See KINSEY, V. E.

COHEN, K.

- (C-96) Packed fractionating columns and the concentration of isotopes. *J. Chem. Phys.*, 8: 588-597 (1940); *C.A.*, 34: 6522. SeDs

COHEN, K., and UREY, H. C.

- (C-97) Van der Waals' forces and the vapor pressures of ortho- and para-hydrogen and ortho- and para-deuterium. *J. Chem. Phys.*, 7: 157-163 (1939); *C.A.*, 33: 3225. ThPh
(C-98) Remarks on a work by K. Schaefer on the thermal properties of ortho- and para-hydrogen and ortho- and para-deuterium. *Z. physik. Chem.*, B43: 432-438 (1939); *C.A.*, 33: 9109. ThF, ThPh

COHN, M.

See VIGNEAUD, V. du; SIMMONDS, S.

COLBY, W. F.

(C-99) Isotope effect in acetylene. *Phys. Rev.*, 47: 388-390 (1935);
C.A., 29: 5013. SpVi

COLLIE, C. H.

(C-100) Separation of the isotopes of hydrogen. *Nature*, 132: 568-569 (1933); C.A., 28: 36. SeEl

CONDON, E. U.

See BREIT, G.

CONN, G. K. T.

See also SUTHERLAND, G. B. B. M.

CONN, G. K. T., and SUTHERLAND, G. B. B. M.

(C-101) The infrared absorption spectrum of tetradeuterioethylene.
Proc. Roy. Soc. London, A172: 172-193 (1939); C.A., 33: 8498. SpVi

CONN, G. K. T., and TWIGG, G. H.

(C-102) Infrared analysis applied to the exchange reaction between ethylene and deuterioethylene. *Proc. Roy. Soc. London*, A171: 70-78 (1939); C.A., 33: 5741. EqG, SpVi

COOK, G. A., and BATES, J. R.

(C-103) The photo-oxidation of hydrogen and deuterium iodides. *J. Am. Chem. Soc.*, 57: 1775-1778 (1935); C.A., 29: 7809. KiP

COOLIDGE, A. S.

See JAMES, H. M.

COOP, I. E.

See BELL, R. P.

COPE, O., BLATT, H., and BALL, M. R.

(C-104) Gastric secretion. III. The absorption of heavy water from pouches of the body and antrum of the stomach of the dog. *J. Clin. Invest.*, 22: 111-115 (1943); C.A., 37: 4780. InBi

COPPOCK, J. B. M.

(C-105) Volume coefficient of expansion of deuterium. *Trans. Faraday Soc.*, 31: 913-914 (1935); C.A., 29: 6809. MeD

COPPOCK, J. B. M., KENYON, J., and PARTRIDGE, S. M.

- (C-106) Attempted resolution of phenyl α, β -dideuteroethyl ketone by an indirect method. J. Chem. Soc., 1938: 1069-1074; C.A., 32: 7431. ElRo

CORNISH, R. E.

See LEWIS, G. N.

CORNOG, R.

See LIBBY, W. F.

CORRIEZ, P.

- (C-107) Hydrogen, the former simple element. A review. Ann. pharm. franç., 19: 601-616 (1934); C.A., 28: 7151. Ge

CRABTREE, R. W.

See CHRISTIANSEN, W. N.

CRAIG, F. N.

See also PRATT, R.

CRAIG, F. N., and TRELEASE, S. F.

- (C-108) Photosynthesis of Chlorella in heavy water. Am. J. Botany, 24: 232-242 (1937); C.A., 31: 4997. BiB, KiP

CRAIG, R.

See FOX, D. L.

CRANE, E. J.

- (C-109) Nomenclature of the hydrogen isotopes and their compounds. A review. Science, 80: 86-89 (1934); C.A., 28: 5754. No

CRAWFORD, B. L., Jr., and BRINKLEY, S. R., Jr.

- (C-110) Force constants in some organic molecules. J. Chem. Phys., 9: 69-75 (1941); C.A., 35: 1280. SpVi

CRAWFORD, F. H., and JORGENSEN, T., Jr.

- (C-111) Band spectrum of LiH and LiD. Phys. Rev., 46: 746-747 (1934); C.A., 29: 45. SpEl

- (C-112) The band spectra of the hydrides of lithium. I. Li⁷D. Phys. Rev., 47: 358-366 (1935); C.A., 29: 5018. SpEl

- (C-113) The band spectra of the hydrides of lithium. II. Phys. Rev., 47: 932-941 (1935); C.A., 29: 7185. SpEl

CRAWFORD, F. H., and JORGENSEN, T., Jr. (Continued)

- (C-114) Isotope relations in the spectra of lithium hydride and lithium deuteride. An abstract. *Phys. Rev.*, 48: 475 (1935); *C.A.*, 31: 5675. SpEl
- (C-115) Potential curves of lithium hydride and of lithium deuteride. An abstract. *Phys. Rev.*, 49: 640 (1936); *C.A.*, 31: 5633. SpEl
- (C-116) The band spectra of the hydrides of lithium. III. Potential curves and isotopic relations. *Phys. Rev.*, 49: 745-752 (1936); *C.A.*, 30: 5882. SpEl

CRAXFORD, S. R., TWIGG, G. H., and RIDEAL, E. K.

- (C-117) Catalytic exchange of deuterium and hydrogen in hydrocarbons. *Nature*, 143: 472-473 (1939); *C.A.*, 33: 4858. EqH

CRENSHAW, C. M.

- (C-118) The loss of energy of hydrogen ions in traversing various gases. *Phys. Rev.*, 62: 54-57 (1942); *C.A.*, 36: 5423. AnMs, MeDf

CRENSHAW, J. L.

See SOLLERS, E. F.

CRIST, R. H., and DALIN, G. A.

- (C-119) Exchange reactions of protium and deuterium. *J. Chem. Phys.*, 1: 677 (1933); *C.A.*, 27: 5636. EqH
- (C-120) Exchange reaction of hydrogen and deuterium oxide. *J. Chem. Phys.*, 2: 442-443 (1934); *C.A.*, 28: 5328. EqH
- (C-121) Exchange reaction of hydrogen and deuterium oxide. *J. Chem. Phys.*, 2: 548 (1934); *C.A.*, 28: 6627. EqH
- (C-122) "Isotopic equilibria" in the hydrogen-hydrogen oxide system. *J. Chem. Phys.*, 2: 735-738 (1934); *C.A.*, 29: 41. EqG, EqH

CRIST, R. H., MURPHY, G. M., and UREY, H. C.

- (C-123) Isotopic analysis of water. *J. Am. Chem. Soc.*, 55: 5060-5061 (1933); *C.A.*, 28: 698. AnRf
- (C-124) The use of the interferometer in the isotopic analysis of water. *J. Chem. Phys.*, 2: 112-115 (1934); *C.A.*, 28: 2989. AnRf

CROMWELL, N. H.

See THOMPSON, A. F., Jr.

CROSS, P. C.

See also LEIGHTON, P. A.; VAN VLECK, J. H.

CROSS, P. C., BURNHAM, J., and LEIGHTON, P. A.

(C-125) Raman spectrum and the structure of water. J. Am. Chem. Soc., 59: 1134-1147 (1937); C.A., 31: 6968. SpVi

CROSS, P. C., and LEIGHTON, P. A.

(C-126) Exchange reactions with deuterium. I. Deuterium and hydrogen chloride. J. Chem. Phys., 4: 28-30 (1936); C.A., 30: 1639. EqG

(C-127) Rapid exchange between deuterioammonia (ammonia d_3) and hydrazine. J. Am. Chem. Soc., 60: 981-982 (1938); C.A., 32: 4055. KiP

CRUICKSHANK, J. H.

See GRAY, F. W.

CUPP, E. E.

See FOX, D. L.

CURRY, J.

See also PRATT, R.

CURRY, J., and HAZELTON, C. L.

(C-128) The solubility of carbon dioxide in deuterium oxide at 25°. J. Am. Chem. Soc., 60: 2771-2773 (1938); C.A., 33: 1575. SoH

(C-129) The first thermodynamic ionization constant of deuteriocarbonic acid at 25°. J. Am. Chem. Soc., 60: 2773-2776 (1938); C.A., 33: 1575. EqI

CURRY, J., and HUGUS, L. Z., Jr.

(C-130) The second ionization constant of deuteriocarbonic acid. J. Am. Chem. Soc., 66: 653 (1944); C.A., 38: 2551. EqI

CURRY, J., PRATT, R., and TRELEASE, S. F.

(C-131) Does dilute heavy water influence biological processes? Science, 81: 275-277 (1934); C.A., 29: 3697. BiB

CURRY, J., and TRELEASE, S. F.

(C-132) Influence of deuterium oxide on the rate of photosynthesis. Science, 82: 18 (1935); C.A., 29: 5865. BiB, KiP

CUTHBERTSON, C.

(C-133) Refractive index of gaseous heavy water. *Nature*, 134: 251 (1934); C.A., 28: 6605. ElRf

CUTHBERTSON, C., and CUTHBERTSON, M.

(C-134) Refractive index of gaseous heavy water. *Proc. Roy. Soc. London*, A155: 213-217 (1936); C.A., 30: 6254. ElRf, MeD

CUTHBERTSON, G. R., and KISTIAKOWSKY, G. B.

(C-135) Resonance fluorescence of benzene. II. *J. Chem. Phys.*, 4: 9-15 (1936); C.A., 30: 1656. SpFl

CUTHBERTSON, M.

See CUTHBERTSON, C.

CUTTER, H. B.

See CHAMBERLAIN, K.

CZERNY, M.

(C-136) Heavy water. A review. *Deut. med. Wochschr.*, 61: 300-301 (1935); C.A., 29: 4669. Bi

DADIEU, A.

- (D-1) Physical methods in the chemical laboratory. XXX. The Raman effect and its application in organic chemistry. 2. Angew. Chem., 49: 344-349 (1936); C.A., 30: 5125. SpVi, Sy

DADIEU, A., and ENGLER, W.

- (D-2) The Raman spectrum of gaseous CD_4 . Naturwissenschaften, 23: 355 (1935); C.A., 29: 5745. SpVi
- (D-3) Exchange of hydrogen ions in the methyl group of heavy acetic acid. Naturwissenschaften, 24: 318 (1936); C.A., 31: 95. EqL

DAGGETT, A. F.

See BROWN, W. G.

DALIN, G. A.

See CRIST, R. H.

DALLAPORTA, N.

See SPECCHIA, O.

DANBY, C. J., and HINSHELWOOD, C. N.

- (D-4) The sensitization of the hydrogen-oxygen reaction by nitrous oxide. J. Chem. Soc., 1940: 464-468. KiG

DANCEY, T. E.

See STERN, K.

DANZ, W.

See SIEVERTS, A.

DARBY, P. F., and BENNETT, W. H.

- (D-5) Negative atomic hydrogen and deuterium ions. Phys. Rev., 49: 881-882 (1936); C.A., 31: 5678. Se

DARMOIS, E.

- (D-6) Un nouveau corps simple. Le deutérium ou hydrogène lourd. 24pp., Hermann & Cie, Paris, 1934; C.A., 28: 2624. Ge
- (D-7) Deuterium and its compounds. A review. Bull. soc. chim. France (5), 2: 1513-1544 (1935); C.A., 30: 2483. Ge
- (D-8) Un nouveau corps simple. Le deutérium ou hydrogène lourd. Pt. II. Hermann & Cie, Paris, 1936; C.A., 30: 4080. Ge
- (D-9) Industrial manufacture and applications of heavy water and of deuterium derivatives. A review. Tech. ind. chim. No. 284 bis 16-18 (1939); C.A., 33: 7497. Se
- (D-10) Contribution of deuterium to organic chemistry. A review. Bull. soc. chim. France, 8: 445-462 (1941); C.A., 36: 1587. Ge

DASCOLA, G.

See SPECCHIA, O.

DAVIS, C. O.

See also JOHNSTON, H. L.

DAVIS, C. O., and JOHNSTON, H. L.

- (D-11) Fractionation of hydrogen isotopes by the addition of sodium to water. J. Am. Chem. Soc., 56: 492-493 (1934); C.A., 28: 1599. SeCh

DAVIS, H. M.

See GLOCKLER, G.

DAVIS, M. E.

See MACHT, D. I.

DAVOUD, J. G., and HINSHELWOOD, C. N.

- (D-12) Kinetics of the thermal decomposition of fully deuterated diethyl ether. Proc. Roy. Soc. London, A174: 50-56 (1940); C.A., 34: 2236. KiG

DAWSON, D. H.

See JOHNSTON, H. L.

DAY, J. N. E., HUGHES, E. D., INGOLD, C. K., and WILSON, C. L.

- (D-13) Hydration of salts with heavy water and remarks on the constitution of salt hydrates. J. Chem. Soc., 1934: 1593-1599; C.A., 29: 670. ThPh

De BOER, J.

See BOER, J. de

DEFFET, L.

See TIMMERMAN, J.

De GIER, J.

See GIER, J. de

De HEMPTINNE, M.

See HEMPTINNE, M. de

DEILE, O.

- (D-14) The rotational isotope effect in the band spectrum of cadmium hydride-deuteride. *Z. Physik*, 106: 405-417 (1937); *C.A.*, 31: 8369. SpVi

DEITZ, V.

See BUSWELL, A. M.

De JONGE, J.

See JONGE, J. de

DELAMATER, A. J.

- (D-15) Effects of heavy water upon the fission rate and the life cycle of the ciliate, *Uroleptus mobilis*. *Biol. Bull.*, 71: 199-216 (1936); *C.A.*, 30: 8268. BiZ

De la RIVIÈRE, R. DUJARRIC

See DUJARRIC de la RIVIÈRE, R.

DELFOSE, J. M.

- (D-16) Raman spectra of heavy arsine, silicochloroform and silicobromoform. *Nature*, 137: 868 (1936); *C.A.*, 30: 5498. SpVi

DELFOSE, J. M.

See also HEMPTINNE, M. de

DELFOSE, J. M., and HIPPLE, J. A., Jr.

- (D-17) The use of isotopes in the study of ionization processes of polyatomic molecules. An abstract. *Phys. Rev.*, 53: 683 (1938); *C.A.*, 33: 5278. EqI

- (D-18) Dissociation of $C_2H_2D_2$ by electron impact. *Phys. Rev.*, 54: 1060-1062 (1938). *C.A.* 33: 2407. EqI

DELFOSE, J. M., JUNGERS, J. C., LEMAITRE, G., TCHANG, Y. L.,
and MANNEBACK, C.

(D-19) Raman spectrum of monodeuterioethylene. *Nature*, 139:
1111-1112 (1937); C.A., 31: 6111. SpVi, Sy

DEMIDENKO, S. G.

(D-20) Isotopic composition of atmospheric precipitations. *Acta
Physicochim. U.R.S.S.*, 13: 305-311 (1940); C.A., 35: 2043.
AbG

DENNISON, D. M.

See also FUSON, N.; HARDY, J. D.; SLAWSKY, Z. I.

DENNISON, D. M., and JOHNSTON, M.

(D-21) Interaction between vibration and rotation for symmetrical
molecules. *Phys. Rev.*, 47: 93-94 (1935); C.A., 29: 1297.
SpVi

De PEREIRA-FORJAZ, A.

See PEREIRA-FORJAZ, A. de

De ROOSTER, J.

See ROOSTER, J. de

De SALAS, E.

See SALAS, E. de

De SOUZA-REIS, F.

See SOUZA-REIS, F. de

DEUBNER, A.

See BEUTLER, H.

DEVONSHIRE, A. F.

See LENNARD-JONES, J. E.

DEZELIC, M.

(D-22) The melting curve of mixtures of heavy and ordinary water:
the solubility equilibrium in the system. *Z. anorg. Chem.*,
225: 173-174 (1935); C.A., 30: 941. ThPh

(D-23) Percentage increase of heavy water in water through frac-
tional crystallization. *Bull. soc. chim. roy. Yougoslav.*,
7: 65-71 (1936); C.A., 31: 5653. SeCr

DIAMOND, H.

See TAYLOR, H. S.

DICKEL, G.

See CLUSIUS, K.

DICKERSON, V. G.

See BARBOUR, H. G.

DIEKE, G. H.

(D-24) Isotopic shift in the spectra of diatomic molecules. *Phys. Rev.*, 47: 661-665 (1935); *C.A.*, 29: 5017. SpEl

(D-25) The $3p\ ^3\Sigma \rightarrow 2s\ ^3\Sigma$ bands of HD and D₂. *Phys. Rev.*, 48: 606-609 (1935); *C.A.*, 30: 5122. SpEl

(D-26) The 1X -level of the hydrogen molecule. *Nature*, 137: 944-945 (1936); *C.A.*, 30: 5882. SpEl

(D-27) The $2s\ ^1\Sigma \rightarrow 2p\ ^1\Sigma$ bands of the hydrogen molecules. *Phys. Rev.*, 50: 797-805 (1936); *C.A.*, 31: 33. SpEl

See also WOOD, R. W.

DIEKE, G. H., and BLUE, R. W.

(D-28) Spectrum of the H¹H² and H₂² molecules. *Nature*, 133: 611-612 (1934); *C.A.*, 28: 4310. SpEl

(D-29) A $^1\Pi \rightarrow ^1\Delta$ band of NH² and the corresponding NH² band. *Phys. Rev.*, 45: 395-400 (1934); *C.A.*, 28: 6063. SpEl

(D-30) The Fulcher bands of HD and D₂. *Phys. Rev.*, 47: 261-272 (1935); *C.A.*, 29: 3233. SpEl

DIEKE, G. H., and LEWIS, M. N.

(D-31) Bands of HD and D₂ ending on the $2p\ ^1\Sigma$ state. *Phys. Rev.*, 52: 100-125 (1937); *C.A.*, 31: 7334. SpEl

DIJK, H. van

See KEESOM, W. H.

DINGENEN, W. van

(D-32) Proof of the adsorption theory of Polanyi by adsorption measurements with different gases on glass and charcoal below the critical temperature. *Physica*, 6: 353-363 (1939); *C.A.*, 33: 5260. AdG, MeSt

DINGENEN, W. van, and ITTERBEEK, A. van

(D-33) Measurements of the adsorption of light and heavy hydrogen

DINGENEN, W. van, and ITTERBEEK, A. van (Continued)

on charcoal between 90° and 17°K. *Physica*, 6: 49-58 (1939); C.A., 33: 2388. AdG

DITCHBURN, R. W., and HARDING, J.

(D-34) The absorption of light in cesium vapor in the presence of foreign gases. *Proc. Roy. Soc. London*, A157: 66-79 (1936); C.A., 31: 317. SpA

DITCHBURN, R. W., and ROULSTON, K. I.

(D-35) The sputtering of platinum in hydrogen and deuterium. *Proc. Cambridge Phil. Soc.*, 37: 438-439 (1941); C.A., 36: 327. MeDf

DIVIL'KOVSKII, M. A.

(D-36) Some data on the dispersion and absorption of electromagnetic waves of ultra-high frequency in H₂O, D₂O, and aqueous solutions of KCl. *Bull. acad. sci. U.R.S.S. Sér. phys.*, 5, No. 1: 51-53 (1941); C.A., 38: 683. ElD

DIVIL'KOVSKII, M. A., and MASCH, D. I.

(D-37) Dispersion and absorption of electromagnetic waves in heavy water. *Compt. rend. acad. sci. U.R.S.S.*, 27: 801-802 (1940); C.A., 35: 1678. ElD

DOEBBELING, S. E.

See CALDWELL, M. L.

DOEDE, C.

See HARKINS, W. D.

DOEHLEMANN, E., and LANGE, E.

(D-38) Heat of dilution and heat of vaporization of D₂O-H₂O mixtures. *Z. physik. Chem.*, A173:295-312; *Z. Elektrochem.*, 41: 539-540 (1935); C.A., 29: 7778. ThF, ThPh, ThSo

DOEHLEMANN, E., LANGE, E., and VOLL, H.

(D-39) Heat of dilution of heavy water. *Naturwissenschaften*, 22: 526 (1934); C.A., 29: 672. ThSo

DOLE, M.

(D-40) Natural separation of the isotopes of hydrogen. *J. Am. Chem. Soc.*, 56: 999 (1934); C.A., 28: 2989. AbO, AbG

DOLE, M. (Continued)

- (D-41) The natural separation of isotopes of hydrogen. I. The concentration of deuterium in benzene, kerosene and honey. *J. Chem. Phys.*, 2: 337-341 (1934); *C.A.*, 28: 6061. AbG, AbO, AnDn
- (D-42) Is water isotopically fractionated on partial condensation of its vapor? A correction to my paper on "The natural separation of isotopes, etc." *J. Chem. Phys.*, 2: 548-549 (1934); *C.A.*, 28: 6626. AbG, AbO
- (D-43) The concentration of deuterium in organic compounds. II. A general discussion with particular reference to benzene. *J. Am. Chem. Soc.*, 58: 580-585 (1936); *C.A.*, 30: 5190. AbO, AnDn
- (D-44) Isotopic fractionation of water by physiological processes. *Science*, 83: 351 (1936); *C.A.*, 31: 3070. AbO

See also GABBARD, J. L.; SWARTOUT, J. A.

DOLE, M., and GIBNEY, R. B.

- (D-45) Deuterium abundance ratios in organic compounds. III. Cholesterol. *J. Am. Chem. Soc.*, 58: 2552-2555 (1936); *C.A.*, 31: 1440. AbO, AnDn

DOMANGE, L.

- (D-46) Heavy water. A review. *Ann. pharm. franç.*, 41: 144-148 (1934); *C.A.*, 28: 3656. Ge

DOMINIK, W.

- (D-47) Heavy water. *Polish Agr. Forest. Ann.*, 33: 359-370 (1934); *C.A.*, 29: 1029. Ge

DONATELLI, L.

- (D-48) Action of heavy water D_2O on some organs of involuntary function. *Arch. ital. sci. farmacol.*, 7: 201-228 (1938); *C.A.*, 39: 2081. BiZ

DONZOVA, E. I. (DONZOWA, E. I., DONTSOVA, E. I.)

See BRODSKII, A. I.

DOODY, T. C.

See LEWIS, G. N.

DOUCET, J.

- (D-49) Study of the ultraviolet absorption spectrum of KI in heavy water and ordinary water. *Compt. rend.*, 216: 198-200 (1943); *C.A.*, 39: 1806. SpEl

DOUCET, J., and VODAR, B.

- (D-50) Comparison of absorption spectra of sodium chloride in heavy and in ordinary water. *Compt. rend.*, 213: 996-998 (1941); *C.A.*, 37: 4010. SpEl

DOWDEN, D. A.

See BEEBE, R. A.

DOWNS, W. R.

See GILLESPIE, L. J.

DRIKOS, G.

See BARTHOLOMÉ, E.

DRINKWATER, J. W., RICHARDSON, O., and WILLIAMS, W. E.

- (D-51) Determination of the Rydberg constants, e/m and the fine structures of $H\alpha$ and $D\alpha$ by means of a reflection echelon. *Proc. Roy. Soc. London*, A174: 164-168 (1940); *C.A.*, 34: 2251. SpA
- (D-52) Determination of the Rydberg constants, e/m and the fine structures of $H\alpha$ and $D\alpha$ by means of a reflection echelon. *Proc. Roy. Soc. London*, A175: 345 (1940); *C.A.*, 34: 5341. SpA

DRUCKER, C.

- (D-53) Ion equilibrium in heavy water. *Trans. Faraday Soc.*, 33: 660-670 (1937); *C.A.*, 31: 7314. EqI

DUHM, B.

- (D-54) The change in the absorption spectrum of complex chromium salts by substitution of heavy water and heavy ammonia. *Z. physik. Chem.*, B38: 359-365 (1937); *C.A.*, 32: 2834. ElCl

DUJARRIC de la RIVIÈRE, R., and ROUX, E.

- (D-55) Does heavy water have any action on bacteria? *Compt. rend.*, 200: 984-985 (1935); *C.A.*, 29: 4034. BiB

DUNCAN, A. B. F.

- (D-56) Ultraviolet absorption spectrum of ND_3 . Phys. Rev., 47: 886-887 (1935); C.A., 29: 5744. SpEl
- (D-57) The ultraviolet absorption spectrum of ammonia. III. The absorption spectra of the deuterioammonias. A note on the Rydberg series in ammonia. Phys. Rev., 50: 700-704 (1936); C.A., 30: 2096. SpEl

See also LAWSON, M.

DUNGERN, M. F. von

- (D-58) Has heavy water an influence on physiological processes? Z. Biol., 97: 187-194 (1936); C.A., 30: 8254. BiZ

DUPOUY, G.

- (D-59) Rotatory magnetic dispersion of heavy benzene and heavy alcohol. Compt. rend., 209: 453-455 (1939); C.A., 33: 9066. ElMr

DUPOUY, G., and FERT, C.

- (D-60) Rotatory magnetic power of heavy water. Dispersion and thermal variation. Compt. rend., 208: 1298-1299 (1939); C.A., 33: 4842. ElMr

DUVEEN, D., and WILLEMART, A.

- (D-61) Deuterium and molecular asymmetry. Rev. sci., 78: 279-285 (1940); Chem. Zentr., I: 3351 (1941); C.A., 38: 1925. ElRo

du VIGNEAUD, V.

See VIGNEAUD, V. du

DYAS, H. E.

See CALVIN, M.

DYBING, O.

See also HANSEN, K.

DYBING, O., GULDBERG, G., and HANSEN, K.

- (D-62) Pathological anatomical changes in subacute deuterium oxide poisoning of mice. Klin. Wochschr., 17: 1585 (1938); C.A., 33: 1032. BiZ

EBENEDER, F.

See KAILAN, A.

EBERLY, K.

See BROWN, W. G.

EBERS, E. S., and NIELSEN, H. H.

- (E-1) Infrared absorption bands in the spectrum of deuterioformaldehyde. *J. Chem. Phys.*, 6: 311-315 (1938); *C.A.*, 32: 6153. SpVi

EDDY, R. D., MACHEMER, P. E., and MENZIES, A. W. C.

- (E-2) Retroflex aqueous solubility curves, and the respective solubilities of the monohydrate and monodeuteriate of manganese sulfate in ordinary and in deuterium water. *J. Phys. Chem.*, 45: 908-915 (1941); *C.A.*, 35: 5769. SoH

EDDY, R. D., and MENZIES, A. W. C.

- (E-3) The solubilities of certain inorganic compounds in ordinary water and in deuterium water. *J. Phys. Chem.*, 44: 207-235 (1940); *C.A.*, 34: 1898. SoH, ThPh

EDSALL, J. T.

- (E-4) Raman spectra of amino acids and related compounds. IV. Ionization of di- and tricarboxylic acid. *J. Chem. Phys.*, 5: 508-517 (1937); *C.A.*, 31: 5682. SpVi

See also OTVOS, J. W.

EDSALL, J. T., and SCHEINBERG, H.

- (E-5) Raman spectra of amino acids and related compounds. V. Deuterium substitution in the amino group. *J. Chem. Phys.*, 8: 520-525 (1940); *C.A.*, 34: 5757. SpVi

EDSE, R., and HARTECK, P.

- (E-6) The analysis of gas mixtures by means of the desorption-thermal conductivity method. II. *Angew. Chem.*, 53: 210-213 (1940); *C.A.*, 34: 6897. AnTh

EDWARDS, A. J., BELL, R. P., and WOLFENDEN, J. H.

- (E-7) Deuterium content of naturally occurring water. *Nature*, 135: 793 (1935); C.A., 29: 4669. AbG

EDWARDS, A. J., WALTON, H. F., BELL, R. P., and WOLFENDEN, J. H.

- (E-8) The electrolytic separation of deuterium. *J. Chem. Soc.*, 1936: 286-287; C.A., 30: 3332. SeEl

EHRKE, L. F.

See SLACK, C. M.

EICHELBERGER, W. C.

See La MER, V. K.

EICHNER, C.

See LOMBARD, V.

EINECKE, E.

- (E-9) General and inorganic chemistry of deuterium. A review. *Wien. Chem.-Ztg.*, 41: 331-340, 355-359, 371-376, 395-400 (1938); C.A., 33: 905. Ge

EISENBUD, L.

- (E-10) The photoelectric effect of the deuteron. *Phys. Rev.*, 55: 1129 (1939); C.A., 34: 4981. NuM

ELEY, D. D.

- (E-11) The interchange of hydrogen in the adsorbed film on tungsten. *Proc. Roy. Soc. London*, A178: 452-464 (1941); C.A., 36: 16. AdG, KiH

ELEY, D. D., and POLANYI, M.

- (E-12) Catalytic interchange of hydrogen with water and alcohol. *Trans. Faraday Soc.*, 32: 1388-1397 (1936); C.A., 31: 26. KiH

ELEY, D. D., and RIDEAL, E. K.

- (E-13) The catalysis of the parahydrogen conversion by tungsten. *Proc. Roy. Soc. London*, A178: 429-451 (1941); C.A., 36: 22. KiH

ELEY, D. D., and TUCK, J. L.

- (E-14) Microthermoconductivity method for the estimation of para-

ELEY, D. D., and TUCK, J. L. (Continued)

hydrogen and deuterium. Trans. Faraday Soc., 32: 1425-1428 (1936); C.A., 31: 38. AnTh

ELLINGHAM, H. J. T.

See NEWELL, W. G.

ELLIS, J. W., and BATH, J.

(E-15) Modifications in the near infrared absorption spectra of protein and of light and heavy water molecules when water is bound to gelatin. J. Chem. Phys., 6: 723-729 (1938); C.A., 33: 39. SpVi

ELLIS, J. W., and KINSEY, E. L.

(E-16) Vibrational-rotational radiation transitions in water molecules in nonpolar solvents. Phys. Rev., 54: 599-601 (1938); C.A., 33: 479. SpVi

ELLIS, J. W., and SORGE, B. W.

(E-17) The infrared absorption spectrum of water containing deuterium. J. Chem. Phys., 2: 559-564 (1934); C.A., 28: 6632. SpVi

EMELEUS, H. J.

See also ANDERSON, J. S.; ROBERTS, E. R.

EMELEUS, H. J., and BRISCOE, H. V. A.

(E-18) Preparation and properties of methyldideuteramine. J. Chem. Soc., 1937: 127-130; C.A., 31: 2168. SpVi, Sy, ThPh

EMELEUS, H. J., JAMES, F. W., KING, A., PEARSON, T. G., PURCELL, R. H., and BRISCOE, H. V. A.

(E-19) The isotopic ratio in hydrogen: a general survey by precise density comparisons upon water from various sources. J. Chem. Soc., 1934: 1207-1219; Chemistry & Industry, 53: 491-492 (1934); C.A., 28: 7151. AbG, AnDn

(E-20) The isotopic ratio in hydrogen: a general survey by precise density comparisons upon water from various sources. II. J. Chem. Soc., 1934: 1948-1950; C.A., 29: 2077. AbG, AnDn

ENDERS, C.

(E-21) Isotopes in biochemical research. Angew. Chem., 53: 28-31 (1940); C.A., 34: 3170. InBi

ENGELMANN, F.

- (E-22) Light excitation through homogeneous canal rays of low velocity. *Z. Physik*, 113: 462-481 (1939); *C.A.*, 34: 22. SpEl, SpVi

ENGLER, W.

- (E-23) Investigation of deuterium compounds. II. Raman spectra of deuterioacetic acid and deuterioacetone. *Z. physik. Chem.*, B32: 471-474 (1936); *C.A.*, 30: 5127. SpVi
- (E-24) Deuterium compounds. III. Raman spectra of deuterium compounds of the type $CD_3.CO.X$. *Z. physik. Chem.* B35: 433-441 (1937); *C.A.*, 31: 5274. SpVi, Sy

See also DADIEU, A.

EPPRECHT, A.

See ERLENMEYER, H.; SCHWARZENBACH, G.

ERIKSSON-QUENSEL, I. B.

See SVEDBERG, T.

ERLENMEYER, H.

- (E-25) Preparation of compounds of heavy hydrogen. A review. *Z. Elektrochem.*, 44: 8-14 (1938); *C.A.*, 32: 2410. Sy

See also McDougall, E. J.; SCHWARZENBACH, G.

ERLENMEYER, H., and BITTERLIN, O.

- (E-26) Chemistry of deuterium compounds. The optically active sodium ammonium salt of 1,2-dihydroxyethane- d_2 -1,2-dicarboxylic acid. *Helv. Chim. Acta*, 23: 207-209 (1940); *C.A.*, 34: 2667. ElRo

ERLENMEYER, H., BITTERLIN, O., and WEBER, H. M.

- (E-27) Deuterium compounds. Preparation of glyoxal- d_2 , trans-ethylene- d_2 -dicarboxylic acid and *dl*-1,2-dihydroxyethane- d_2 -1,2-dicarboxylic acid. *Helv. Chim. Acta*, 22: 701-706 (1939); *C.A.*, 33: 6800. Sy, ThPh

ERLENMEYER, H. B., and EPPRECHT, A.

- (E-28) The dissociation ratios of water- d_1 (HOD). I. *Helv. Chim. Acta*, 19: 677-680 (1936); *C.A.*, 30: 6628. EqI
- (E-29) Benzoic- d_5 acid. *Helv. Chim. Acta*, 19: 1056-1059 (1936); *C.A.*, 31: 671. EqI, SoH, ThPh, ThF

ERLENMEYER, H. B., EPPRECHT, A., LOBECK, H., and GAERTNER, H.

- (E-30) Determination of active hydrogen atoms in organic compounds by means of H,D-isotope analysis. *Helv. Chim. Acta*, 19: 354-357 (1936); C.A., 30: 4059. InKi, InSt

ERLENMEYER, H. B., FISCHER, H. O. L., and BAER, E.

- (E-31) The synthesis of glycerol-d₁ from optically active acetone-d-glyceraldehyde. *Helv. Chim. Acta*, 20: 1012-1014 (1937); C.A., 32: 2905. ElRo, Sy

ERLENMEYER, H. B., and GAERTNER, H.

- (E-32) Concentration of the heavy hydrogen isotope by electrolysis. *Helv. Chim. Acta*, 17: 30-31 (1934); C.A., 28: 2264. SeEl
- (E-33) Deuterium oxide content of water from milk. *Helv. Chim. Acta*, 17: 334 (1934); C.A., 28: 3430. AbO
- (E-34) Heavy-water content of biological fluids. *Helv. Chim. Acta*, 17: 549-550 (1934); C.A., 28: 6727. AbO
- (E-35) Experiments on heavy water. *Nature*, 134: 327 (1934); C.A., 28: 7151. EqI, SoO, ThPh
- (E-36) Distribution of H₂O and D₂O in different systems. *Helv. Chim. Acta*, 17: 970-973 (1934); C.A., 29: 976. EqL, ThPh
- (E-37) Stability of Co(NH₃)₆(NO₃)₃ in water containing D₂O. *Helv. Chim. Acta*, 17: 1008-1010 (1934); C.A., 29: 976. EqL
- (E-38) A laboratory set-up for the electrolytic fractionation of hydrogen isotopes. II. *Helv. Chim. Acta*, 17: 1226-1231 (1934); C.A., 29: 999. SeEl
- (E-39) A laboratory set-up for the electrolytic fractionation of hydrogen isotopes. III. *Helv. Chim. Acta*, 18: 419-426 (1935); C.A., 29: 3596. SeEl
- (E-40) Analysis of organic compounds containing hydrogen and deuterium. *Helv. Chim. Acta*, 19: 129-144 (1936); C.A., 30: 2880. AbO, AnDn
- (E-41) Asymmetric carbon atom HDCR'R". I. Constitution of a H,D-hydrocinnamic acid from cinnamic acid and deuterium. *Helv. Chim. Acta*, 19: 145-148 (1936); C.A., 30: 2944. Sy
- (E-42) Asymmetric carbon atom, HDCR'R". II. Attempts to resolve a deuteriohydrocinnamic acid into optical antipodes. *Helv. Chim. Acta*, 19: 331-335 (1936); C.A., 30: 4160. ElRo

ERLENMEYER, H. B., and LOBECK, H.

- (E-43) The behavior of metal-ammonia compounds in water con-

ERLENMEYER, H. B., and LOBECK, H. (Continued)

- taining D_2O . *Helv. Chim. Acta*, 18: 1213-1215 (1935); C.A., 29: 7850. EqL
- (E-44) The hydrocarbon C_6H_6 . *Helv. Chim. Acta*, 18: 1464-1466 (1935); C.A., 30: 1751. Sy, ThPh
- (E-45) The preparation and properties of acetyl- d_3 -choline. *Helv. Chim. Acta*, 20: 142-143 (1937); C.A., 31: 3005. Bi, Sy

ERLENMEYER, H. B., LOBECK, H., and EPPRECHT, A.

- (E-46) Reactions with benzene- d_6 . *Helv. Chim. Acta*, 19: 546-547 (1936); C.A., 30: 6345. Sy
- (E-47) Benzoic- d_5 acid. *Helv. Chim. Acta*, 19: 793-794 (1936); C.A., 30: 6349. SoH, Sy, ThPh

ERLENMEYER, H. B., LOBECK, H., GAERTNER, H., and EPPRECHT, A.

- (E-48) Benzene- d_6 and a phenyl- d_3 -carboxylic acid. *Helv. Chim. Acta*, 19: 336-337 (1936); C.A., 30: 4155. ElRf, MeD, Sy, ThPh

ERLENMEYER, H. B., and SCHENKEL, H.

- (E-49) Asymmetric carbon atom $HDCR'R''$. III. Phenyl- d_5 -phenyl-acetic acid. *Helv. Chim. Acta*, 19: 1169-1170 (1936); C.A., 31: 1018. ElRo, Sy
- (E-50) The optical rotatory power of hydrogen and deuterium compounds. *Helv. Chim. Acta*, 19: 1199-1200 (1936); C.A., 31: 1013. ElRo, Sy
- (E-51) Heavy water and water as solvents for optically active substances. *Helv. Chim. Acta*, 19: 1381-1382 (1936); C.A., 31: 1013. ElRo
- (E-52) Benzene- d_6 as solvent for optically active materials. *Helv. Chim. Acta*, 21: 114 (1938); C.A., 32: 3359. ElRo
- (E-53) Interchange experiments with acetyl- d_3 -compounds. *Helv. Chim. Acta*, 21: 706-708 (1938); C.A., 32: 7902. EqQ

ERLENMEYER, H. B., SCHENKEL, H., and EPPRECHT, A.

- (E-54) Use of deuterium as an indicator in stereochemical investigation. *Nature*, 138: 547 (1936); C.A., 30: 8173. InSt
- (E-55) Study of racemization with deuterium as indicator. *Helv. Chim. Acta*, 19: 1053-1056 (1936); C.A., 31: 672. InSt
- (E-56) Study of catalytic racemization with deuterium as an indicator. *Helv. Chim. Acta*, 20: 367-368 (1937); C.A., 31: 5784. InKi, Sy

ERLENMEYER, H. B., and SCHOENAUER, W.

- (E-57) Kolbe's electrochemical synthesis in deuterium oxide. *Helv. Chim. Acta*, 20: 222-223 (1937); *C.A.*, 31: 3795. EqL
- (E-58) The thermal decomposition of dibenzoyl peroxide in the presence of deuterium. *Helv. Chim. Acta*, 20: 1015-1016 (1937); *C.A.*, 32: 1252. KiH, Sy

ERLENMEYER, H. B., SCHOENAUER, W., and SCHWARZENBACH, G.

- (E-59) Interchanges in water and deuterium oxide. *Helv. Chim. Acta*, 20: 726-732 (1937); *C.A.*, 31: 6104. EqI, Sy

ERLENMEYER, H. B., SCHOENAUER, W., and SUELLMANN, H.

- (E-60) Chemical and biochemical dehydrogenation of an ethane- α -d, α' -d-dicarboxylic acid. *Helv. Chim. Acta*, 19: 1376-1380 (1936); *C.A.*, 31: 1363. KiB

ERLENMEYER, H. B., SUELLMANN, H., and SCHENKEL, H.

- (E-61) Acetylation reactions with acetyl-d₃ compounds. *Helv. Chim. Acta*, 21: 401-404 (1938); *C.A.*, 32: 5376. Sy

ERLENMEYER, H. B., and VERZAR, F.

- (E-62) Has heavy water an influence on physiological processes? *Z. Biol.*, 97: 519-521 (1936); *C.A.*, 31: 2622. BiZ

ERLENMEYER, H. B., and WEBER, H. M.

- (E-63) Stereochemistry of ketoximes. The behavior of acetoxime in deuterium oxide. *Helv. Chim. Acta*, 21: 614-615 (1938); *C.A.*, 32: 5376. EqL
- (E-64) Structure of thiazole. *Helv. Chim. Acta*, 21: 863-866 (1938); *C.A.*, 32: 7915. InSt

ERLENMEYER, H. B., WEBER, H. M., and WIESSMER, P.

- (E-65) Structure of heterocyclic aromatic compounds with deuterium as indicator. II. *Helv. Chim. Acta*, 21: 1017-1022 (1938); *C.A.*, 33: 603. InSt

ERRERA, J.

See also CARTWRIGHT, C. H.

ERRERA, J., GASPART, R., and SACK, H.

- (E-66) Infrared O-H band and association. *J. Chem. Phys.*, 8: 63-71 (1940); *C.A.*, 34: 1562. SpVi

ESTERMANN, I., SIMPSON, O. C., and STERN, O.

- (E-67) Magnetic deflection of HD molecules. *Phys. Rev.*, 51: 64 (1937); *C.A.*, 32: 5292. NuMg

ESTERMANN, I., and STERN, O.

- (E-68) The magnetic deflection of the isotopic hydrogen molecules and the magnetic moment of the deuteron. *Z. Physik*, 86: 132-134 (1933); *C.A.*, 28: 1265. NuMg
- (E-69) Magnetic moment of the deuteron. *Nature*, 133: 911 (1934); NuMg

EUCKEN, A.

- (E-70) Calorific and thermal properties of the light and heavy hydrogens at low temperatures. *J. phys. radium*, 7: 281-288 (1936); *C.A.*, 30: 7991. SpVi, ThF, ThPh

See also BARTHOLOMÉ, E.

EUCKEN, A., and BRATZLER, K.

- (E-71) The electrolytic separation factor of the hydrogen isotopes under various experimental conditions. *Z. physik. Chem.*, A174: 273-290 (1935); *C.A.*, 30: 916. SeEl

EUCKEN, A., and JAACKS, H.

- (E-72) Excitation by collision of intramolecular vibrations in gases and gas mixtures measured by the dispersion of sound. III. Measurements on nitrous oxide. *Z. physik. Chem.*, B30: 85-112 (1935); *C.A.*, 30: 921. MeAc, MeDf

EUCKEN, A., and SCHAEFER, K.

- (E-73) Comment on the work of M. Dezelic: "The melting curve of mixtures of heavy water and water." *Z. anorg. Chem.*, 225: 319-320 (1935); *C.A.*, 30: 2089. ThPh
- (E-74) Enrichment of heavy water in glacial ice and melting diagram of system $\text{H}_2\text{O}-\text{D}_2\text{O}$. *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 109-125 (1935); *C.A.*, 31: 4880. AbG, ThPh
- (E-75) Further investigations of the enrichment of heavy water in glacial ice. *Nachr. Ges. Wiss. Goettingen, Math. physik. Klasse, Fachgruppe III*, 1: 137-146 (1935); *C.A.*, 31: 5633. AbG, SeCr

EVANS, A. G.

See also BAWN, C. E. H.

EVANS, A. G., and EVANS, M. G.

- (E-76) Mechanism of reactions between alkali atoms and halogen hydrides. *Trans. Faraday Soc.*, 31: 1400-1410 (1935); *C.A.*, 30: 385. KiH

EVANS, E. A., Jr.

See RITTENBERG, D.; SCHOENHEIMER, R.

EVANS, E. M., RYDON, H. N., and BRISCOE, H. V. A.

- (E-77) Isotopic exchange reaction between deuterium oxide and cis- and trans-glutaconic acids. *J. Chem. Soc.*, 1939: 1673-1679; *C.A.*, 34: 989. EqL

EVANS, M. G.

- (E-78) The quenching of mercury resonance radiation by compounds containing deuterium. *J. Chem. Phys.*, 2: 445-451 (1934); *C.A.*, 28: 6636. SpVi
- (E-79) A comparison of the photosensitized reaction of hydrogen and oxygen, and deuterium and oxygen. *J. Chem. Phys.*, 2: 726-732 (1934); *C.A.*, 29: 49. KiG

See also BELTON, J. W.; EVANS, A. G.

EVANS, M. G., and TAYLOR, H. S.

- (E-80) A kinetic expression for the rate of the photosensitized decomposition of ammonia and deuterioammonia (ammonia-d₃). *J. Chem. Phys.*, 2: 732-734 (1934); *C.A.*, 29: 49. KiG

EWART, A. J.

- (E-81) The influence of heavy water on plants. *Australian J. Exptl. Biol. Med. Sci.*, 13: 9-15 (1935); *C.A.*, 29: 4781. BiB

EYRING, H.

- (E-82) Zero-point energy and the separation of isotopes. *Proc. Natl. Acad. Sci. U.S.*, 19: 78-81 (1933); *C.A.*, 27: 3137. SeAd, SeEl

See also GORIN, E.; HIRSCHFELDER, J. O.; TAYLOR, H. S.; TOPLEY, B.

EYRING, H., and SHERMAN, A.

- (E-83) Theoretical considerations concerning the separation of isotopes. *J. Chem. Phys.*, 1: 345-349 (1933); *C.A.*, 27: 3664. SeAd, SeEl

FABIAN, F.

- (F-1) Microseparatory apparatus. *Mikrochemie ver. Mikrochim. Acta*, 2: 332 (1937); C.A., 32: 1518. ThPh

See also ABEL, E.

FAGERHOLM, E.

- (F-2) An isolated line group in the spectrum of CH and CD. *Naturwissenschaften*, 25: 106-107 (1937); C.A., 31: 6967. SpEl
- (F-3) The $^2\Sigma \rightarrow ^2\Pi$ and $^2\Delta \rightarrow ^2\Pi$ systems of the band spectra of CH and CD. *Arkiv Mat., Astron. Fysik*, 27A, No. 19: 18pp. (1940); C.A., 35: 383. SpEl

FAHLENBRACH, H.

See CABRERA, B.

FAJANS, E.

- (F-4) Hydrogen catalysis on nickel. I. Comparison of the rate of conversion of para-hydrogen with the reaction rate $H_2 + D_2 = 2HD$ on nickel surfaces. *Z. physik. Chem.*, B28: 239-251 (1935); C.A., 29: 4251. KiH

See also BONHOEFFER, K. F.

FARBENIND., A. G., I. G.

See PATENTS, GERMAN

FARKAS, A.

- (F-5) Orthohydrogen, parahydrogen and heavy hydrogen. 229pp., The Macmillan Company, New York, 1935; C.A., 29: 2454. Ge
- (F-6) A method of analysis of heavy water. *Trans. Faraday Soc.*, 32: 413-415 (1936); C.A., 30: 2817. AnTh, EqH
- (F-7) The catalytic interaction of ammonia with deuterium. *Trans. Faraday Soc.*, 32: 416-427 (1936); C.A., 30: 2836. EqG, KiG

FARKAS, A. (Continued)

- (F-8) The thermal interaction of deuterium and ammonia. J. Chem. Soc., 1936: 26-36; C.A., 30: 2836. KiG
- (F-9) Mechanism of the catalytic exchange reaction between deuterium and water. Trans. Faraday Soc., 32: 922-932 (1936); C.A., 30: 5864. KiH
- (F-10) The electrolytic separation of the hydrogen isotopes on a palladium cathode. Trans. Faraday Soc., 33: 552-559 (1937); C.A., 31: 8389. SeEl
- (F-11) Activation of hydrogen in catalytic reactions of hydrocarbons. Trans. Faraday Soc., 35: 906-917 (1939); C.A., 33: 9103. KiH
- (F-12) Catalytic exchange of hydrogen atoms between molecular deuterium and propane and butane. Trans. Faraday Soc., 36: 522-527 (1940); C.A., 34: 4724. EqH

See also FARKAS, L.

FARKAS, A., and FARKAS, L.

- (F-13) Experiments on heavy hydrogen. Nature, 132: 894 (1933); C.A., 28: 1922. EqH, MeDf
- (F-14) Chemical separation of diplogen (deuterium) from hydrogen. Nature, 133: 139 (1934); C.A., 28: 2265. SeCh
- (F-15) Experiments on heavy hydrogen. I. Proc. Roy. Soc. London, A144: 467-480 (1934); C.A., 28: 3657. AnTh
- (F-16) The equilibrium $\text{H}_2\text{O} + \text{HH}^2 = \text{HOH}^2 + \text{H}_2$ and its role in the separation of the hydrogen isotopes. J. Chem. Phys., 2: 468-469 (1934); C.A., 28: 6626. EqH, EqL, SeCh
- (F-17) Experiments on heavy hydrogen. III. Electrolytic separation of the hydrogen isotopes. Proc. Roy. Soc. London, A146: 623-629 (1934); C.A., 29: 41. EqH, SeEl
- (F-18) Exchange reactions between heavy hydrogen and hydrogen adsorbed in solids. Trans. Faraday Soc., 31: 821-824 (1935); C.A., 29: 4990. EqH
- (F-19) Experiments on heavy hydrogen. V. The elementary reactions of light and heavy hydrogen. Thermal conversion of ortho-deuterium and the interaction of hydrogen and deuterium. Proc. Roy. Soc. London, A152: 124-151 (1935); C.A., 30: 378. EqG, KiG
- (F-20) Experiments on heavy hydrogen. VI. Ratio of the magnetic moment of the proton to the magnetic moment of the deuteron. Proc. Roy. Soc. London, A152: 152-157 (1935); C.A., 30: 378. KiG, NuMg

FARKAS, A., and FARKAS, L. (Continued)

- (F-21) Mechanism of some catalytic exchange reactions of heavy hydrogen. *Trans. Faraday Soc.*, 33: 678-690 (1937); *C.A.*, 31: 7322. KiH
- (F-22) The catalytic interaction of heavy hydrogen and benzene on platinum. *Trans. Faraday Soc.*, 33: 827-837 (1937); *C.A.*, 31: 6542. KiH
- (F-23) The mechanism of hydrogenation reactions and the formation of stereochemical isomers. *Trans. Faraday Soc.*, 33: 837-844 (1937); *C.A.*, 31: 6542. InKi
- (F-24) The catalytic interaction of ethylene and heavy hydrogen on platinum. *J. Am. Chem. Soc.*, 60: 22-28 (1938); *C.A.*, 32: 2414. KiH
- (F-25) The separation of the hydrogen isotopes in the photochemical liberation of hydrogen from aqueous solutions. *Trans. Faraday Soc.*, 34: 1120-1127 (1938); *C.A.*, 32: 8942. SeCh
- (F-26) The catalytic interaction of acetone and isopropyl alcohol with deuterium on platinum. *J. Am. Chem. Soc.*, 61: 1336-1341 (1939); *C.A.*, 33: 6128. KiH
- (F-27) Catalytic exchange of hydrogen atoms between molecular deuterium and hexane and cyclohexane. *Trans. Faraday Soc.*, 35: 917-920 (1939); *C.A.*, 33: 9103. EqH, KiH
- (F-28) The catalytic interaction of acetylene and hydrogen on platinum. *J. Am. Chem. Soc.*, 61: 3396-3401 (1939); *C.A.*, 34: 932. KiH
- (F-29) The mechanism of the catalytic conversion of para-hydrogen on nickel, platinum and palladium. *J. Am. Chem. Soc.*, 64: 1594-1599 (1942); *C.A.*, 36: 5414. InKi, KiH
- (F-30) Catalytic polymerization of olefins in the presence of (deuterio) phosphoric acid. *Ind. Eng. Chem.*, 34: 716-721 (1942); *C.A.*, 37: 73. KiL, Sy

FARKAS, A., FARKAS, L., and HARTECK, P.

- (F-31) Experiments on heavy hydrogen. II. The orthopara conversion. *Proc. Roy. Soc. London*, A144: 481-493 (1934); *C.A.*, 28: 3657. KiG
- (F-32) Para-ortho conversion of deuterium. *Science*, 79: 204 (1934); *C.A.*, 28: 4660. KiG
- (F-33) Remark on "The time variation of vapor pressure of hydrogen-isotope mixtures at 20.38° absolute" by K. Steiner. *Physik. Z.*, 37: 447-448 (1936); *C.A.*, 30: 5849. KiG

FARKAS, A., FARKAS, L., and RIDEAL, E. K.

- (F-34) Experiments on heavy hydrogen. IV. Hydrogenation and exchange reaction of ethylene with heavy hydrogen. *Proc. Roy. Soc. London*, A146: 630-639 (1934); C.A., 29: 41. EqQ
- (F-35) Use of the microthermal-conductivity method for the determination of heavy hydrogen. *Nature*, 137: 315 (1936); C.A., 30: 3318. AnTh

FARKAS, A., FARKAS, L., and YUDKIN, J.

- (F-36) Decomposition of sodium formate by *E. coli* in the presence of heavy water. *Proc. Roy. Soc. London*, B115: 373-379 (1934); C.A., 28: 6737. InBi, InKi, KiP

FARKAS, A., and MELVILLE, H. W.

- (F-37) Mercury-photosensitized exchange reactions of deuterium with ammonia, methane and water. *Proc. Roy. Soc. London*, A157: 625-651 (1936); C.A., 31: 1297. KiP

FARKAS, L.

- (F-38) The heavy hydrogen isotope. *Naturwissenschaften*, 22: 614-623, 640-646, 658-662 (1934); C.A., 29: 677. Ge

See also FARKAS, A.

FARKAS, L., and FARKAS, A.

- (F-39) The reaction of the heavy hydrogen isotope with chlorine. *Naturwissenschaften*, 22: 218-219 (1934); C.A., 28: 4982. KiG
- (F-40) The equilibrium $\text{H}_2\text{O} + \text{HD} \rightleftharpoons \text{HDO} + \text{H}_2$. *Trans. Faraday Soc.*, 30: 1071-1079 (1934); C.A., 29: 985. EqH, SpVi
- (F-41) Ratio of the magnetic moment of the proton to the magnetic moment of the deuteron. *Nature*, 135: 372 (1935); C.A., 29: 3227. KiG, NuMg
- (F-42) Catalytic exchange of deuterium and hydrogen in hydrocarbons. *Nature*, 143: 244 (1939); C.A., 33: 3754. KiH

FARKAS, L., and GARBATSKI, U.

- (F-43) The paramagnetic conversion of parahydrogen and orthodeuterium in the presence of nitrous oxide. (The magnetic moment of the deuteron). *J. Chem. Phys.*, 6: 260-263 (1938); C.A., 32: 4881. KiG, NuMg

FARKAS, L., and GARBATSKI, U. (Continued)

- (F-44) Correction: The paramagnetic conversion of parahydrogen and orthodeuterium in the presence of nitric oxide. (The magnetic moment of the deuteron). J. Chem. Phys., 6: 904 (1938); C.A., 33: 921. KiG, NuMg

FARKAS, L., and SANDLER, L.

- (F-45) Ortho-para conversion of hydrogen in diamagnetic liquids. Trans. Faraday Soc., 35: 337-342 (1939); C.A., 33: 2795. KiH
- (F-46) The heterogeneous ortho-para conversion on paramagnetic crystals. J. Chem. Phys., 8: 248-251 (1940); C.A., 34: 2686. KiH
- (F-47) Method for preparing ortho-deuterium. J. Am. Chem. Soc., 62: 2877-2878 (1940); C.A., 34: 7680. EqH, Sy

FARKAS, L., and WIGNER, E.

- (F-48) Calculation of the rate of elementary reactions of light and heavy hydrogen. Trans. Faraday Soc., 32: 708-723 (1936); C.A., 30: 4385. KiG

FEENBERG, E.

- (F-49) Relativity corrections in the theory of the deuteron. Phys. Rev., 50: 674 (1936); C.A., 31: 5668. NuM

FEHER, F.

- (F-50) Raman spectrum of deuterium peroxide. Z. Elektrochem., 43: 663-664 (1937); C.A., 31: 7757. EqL, SpVi, Sy
- (F-51) Hydrogen peroxide and its derivatives. III. Raman spectra of D_2O_2 and DHO_2 . Ber., 72B: 1778-1788 (1939); C.A., 33: 9139. SpVi
- (F-52) Hydrogen peroxide and its derivatives. IV. Preparation methods for pure D_2O_2 . Ber., 72B: 1789-1798 (1939); C.A., 33: 9139. MeD, Sy

FEHER, F., and MORGENSTERN, G.

- (F-53) The Raman spectra of D_3AsO_4 and its salts. Naturwissenschaften, 25: 831 (1937); C.A., 32: 2836. SpVi

FELIX, K.

- (F-54) The isotopes of the elements important to life and their significance in the investigation of the intermediary metabolism. A review. Jahreskurse aerztl. Fortbild., 31, No. 9: 45-52 (1940); C.A., 35: 4785. InBi

FENGER-ERIKSEN, K., KROGH, A., and USSING, H.

- (F-55) A micro method for the accurate determination of D_2O in water. *Biochem. J.*, 30: 1264-1269 (1936); *C.A.*, 30: 7000. AnDn

FERGUSON, A.

See also COCKETT, A. H.

FERGUSON, A., and COCKETT, A. H.

- (F-56) Specific heat of a liquid at different temperatures. *Nature*, 138: 842-843 (1936); *C.A.*, 31: 1286. ThF

FERT, C.

- (F-57) Magnetic rotatory power of C_6D_6 and C_2D_5OD . Thermal variation. *Compt. rend.*, 209: 479-480 (1939); *C.A.*, 33: 9066. ElMr

See also DUPOUY, G.

FETCHER, E. S. Jr.

- (F-58) Modification of apparatus for deuterium oxide determination by the falling drop. *Anal. Chem.*, 16: 412 (1944); *C.A.*, 38: 4473. An

See also VISSCHER, M. B.

FIALKOVSKAYA (FIALKOWSKAJA), O. V., and KATCHENKOV, S. M.

- (F-59) Absorption spectra of neodymium sulfate solutions in ordinary and heavy water. *Acta. Physicochim. U.R.S.S.*, 10: 579-582 (1939); *C.A.*, 33: 6718. ElCl

FICKLEN, J. B.

- (F-60) Isotopic nomenclature. *Science*, 79: 140 (1934); *C.A.*, 28: 1599. No

See also NEWELL, J. L.

FILIPPOVA, N. S. (FILIPPOWA, N. S.)

- (F-61) The isotope ratio in petroleum. *J. Chem. Phys.*, 3: 316 (1935); *C.A.*, 29: 4259. AbG
- (F-62) Hydrogen isotopes in petroleum. *Compt. rend. acad. sci. U.R.S.S.*, 3: 29-30 (1935). AbG

FILIPPOVA, N. S., and SLUTSKAYA, M. M.

- (F-63) Interferometric analysis of heavy water. *J. Phys. Chem. U.S.S.R.*, 8: 468-471 (1936); *C.A.*, 31: 1323. AnDn, AnRf
- (F-64) Interferometric analysis of heavy water. *Acta Physicochim. U.R.S.S.*, 5: 131-136 (1936); *C.A.*, 31: 4226. AnRf
- (F-65) A method for the analysis of heavy water. *Trudy Dnepropetrovsk. Khim.-Tekh. Inst.*, 14-24 (1938); *Khim. Referat. Zhur.*, 2, No. 1: 9 (1939); *C.A.*, 33: 9071. An

FINK, A.

See also BARONI, E.

FINK, A., and GROSS, P.

- (F-66) A microcell for the measurement of electrolytic conductivities. *Mikrochemie ver. Mikrochim. Acta*, 18: 169-174 (1935); *C.A.*, 30: 3. EcC

FINK, A., GROSS, P., and STEINER, H.

- (F-67) The conductivity of strong acids in heavy and light water. *Monatsh.*, 66: 111-118 (1935); *C.A.*, 29: 7760. EcC

FINK, C. G., UREY, H. C., and LAKE, D. B.

- (F-68) The diffusion of hydrogen through metals: fractionating the hydrogen isotopes. *J. Chem. Phys.*, 2: 105-106 (1934); *C.A.*, 28: 2264. MeDf, SeDf
- (F-69) Diffusion of hydrogen through metals: fractionating the hydrogen isotopes. *J. Chem. Phys.*, 2: 301 (1934); *C.A.*, 28: 4306. MeDf, SeDf

FISCHER, A.

- (F-70) Growth of tissue cells in heavy water. *Protoplasma*, 26: 51-55 (1936); *C.A.*, 31: 2237. BiB

FISCHER, H. O. L.

See ERLLENMEYER, H.

FLEMING, G. H.

See WHITMORE, F. C.

FLOOD, H.

See also TRONSTAD, L.

FLOOD, H., and TRONSTAD, L.

- (F-71) Heat of formation of heavy water. *Kgl. Norske Videnskab.*

FLOOD, H., and TRONSTAD, L. (Continued)

- Selskabs Forh., 8: 139-142 (1935); C.A., 33: 8484. ThF
(F-72) The formation of droplets in supersaturated D₂O vapor.
Surface tension of D₂O. Z. physik. Chem., A175: 347-352
(1936); C.A., 30: 2817. MeSt

FLORENSKII, K. P. (FLORENSKY)

See KASATKINA, I. A.; TEIS, R. V.

FLUEGGE, S.

- (F-73) Quadripole moment of the deuteron and nuclear forces. Z.
Physik, 113: 587-595 (1939); C.A., 34: 4984. NuM, NuMg

FLUEGGE, S., and MATTAUCH, J.

- (F-74) Isotope review for 1940. Physik. Z., 42: 1-5 (1941); C.A.,
35: 5025. Ge
(F-75) Report on isotopes, 1941. Physik. Z., 43: 1-5 (1942); C.A.,
36: 3725. Ge

FOERSTER, T.

- (F-76) The equilibrium constant of the reaction $\text{HDO} + \text{H}_2 \rightleftharpoons \text{H}_2\text{O} + \text{HD}$. Z. physik. Chem., B27: 1-5 (1934); C.A., 29: 666.
EqH

FOERSTER, T., and JUNGERS, J. C.

- (F-77) The ultraviolet absorption spectra of CH₃NH₂, CD₃NH₂,
CH₃ND₂, and CD₃ND₂. Physik. Z., 38: 140-141 (1937);
C.A., 31: 3385. SpEl
(F-78) The ultraviolet absorption spectrum of deuterium-substituted
methylamines. Z. physik. Chem., B36: 387-397 (1937);
C.A., 31: 8375. SpEl, Sy

FONTANA, B. J.

- (F-79) Hydrogen exchange of aromatic amines with D₂O and T₂O.
J. Am. Chem. Soc., 64: 2503-2504 (1942); C.A., 37: 562.
EqL

Fonteyne, R.

- (F-80) A note on the Raman spectrum of deuterium perchlorate.
Natuurw. Tijdschr. Belg., 21: 6-8 (1939); C.A., 33: 3263.
SpVi, Sy

FORNWALT, H. J.

See JONES, G.

FORSTNER, H. M.

- (F-81) Heavy hydrogen and heavy water in electroplating. *Oberflächentechnik*, 11: 39-40 (1933); C.A., 28: 3004. EcP

FOSTER, A. G.

See BROAD, D. N.

FOSTER, G. L.

See also RITTENBERG, D.

FOSTER, G. L., KESTON, A. S., RITTENBERG, D., and SCHOENHEIMER, R.

- (F-82) Deuterium as an indicator in the study of intermediary metabolism. XII. The action of proteolytic enzymes on peptides in heavy water. *J. Biol. Chem.*, 124: 159-161 (1938); C.A., 32: 6272. BiC

FOSTER, G. L., RITTENBERG, D., and SCHOENHEIMER, R.

- (F-83) Deuterium as an indicator in the study of intermediary metabolism. XIV. Biological formation of deuterio-amino acids. *J. Biol. Chem.*, 125: 13-22 (1938); C.A., 32: 7984. BiZ

FOSTER, J. S., JONES, D. C., and NEAMTAN, S. M.

- (F-84) Stark effect in the HD and D₂ spectra. *Phys. Rev.*, 51: 1029 (1937); C.A., 32: 5294. SpEl

FOSTER, J. S., and SNELL, A. H.

- (F-85) Stark effect for the hydrogen isotopes. *Nature*, 133: 568 (1934); C.A., 28: 3979. SpEl
- (F-86) The Stark effect in the hydrogen isotopes. *Phys. Rev.*, 47: 338 (1935); C.A., 30: 7444. SpEl
- (F-87) Stark effect in hydrogen and deuterium. *Proc. Roy. Soc. London*, A162: 349-356 (1937); C. A., 31: 8371. SpEl

FOWLER, R. H.

- (F-88) General considerations on the theory of the separation of H¹ and H² by electrolysis of water. *Proc. Roy. Soc. London*, A144: 452-466 (1934); C.A., 28: 3668. SeEl
- (F-89) The heavy isotope of hydrogen. A review. *Proc. Cambridge Phil. Soc.*, 30: 225-241 (1934). Ge

See also BERNAL, J. D.

FOWLER, R. H., and BERNAL, J. D.

- (F-90) Pseudocrystalline structure of water. *Trans. Faraday Soc.*, 29: 1049-1056 (1933); *C.A.*, 28: 1242. EcC

FOX, D. L.

- (F-91) Heavy water and metabolism. A review. *Quart. Rev. Biol.*, 9: 342-346 (1934); *C.A.*, 28: 6728. BiZ
(F-92) Enzymic reactions in heavy water. *J. Cellular Comp. Physiol.*, 6: 405-424 (1935); *C.A.*, 29: 8029. BiC

FOX, D. L., and CRAIG, R.

- (F-93) Enzymic reactions on heavy water. II. Deuterium and the hydrolysis of starch. *Proc. Soc. Exptl. Biol. Med.*, 33: 266-269 (1935); *C.A.*, 30: 6393. BiC

FOX, D. L., CUPP, E. E., and McEWEN, G. F.

- (F-94) Low concentrations of deuterium oxide and the growth of marine diatoms. *Proc. Soc. Exptl. Biol. Med.*, 34: 575-581 (1936); *C.A.*, 30: 6393. BiZ

FRANCK, J., and WOOD, R. W.

- (F-95) Ultraviolet absorption of heavy water vapor. *Phys. Rev.*, 45: 667-668 (1934); *C.A.*, 28: 6064. SpEl

FRANDSEN, M.

See WASHBURN, E. W.

FRANK, A.

See also CLUSIUS, K.

FRANK, A., and CLUSIUS, K.

- (F-96) The entropy of methane. *Z. physik. Chem.*, B36: 291-300 (1937); *C.A.*, 31: 7323. ThF, ThPh
(F-97) Precision measurements of the heat of vaporization of the gases: O₂, H₂S, PH₃, A, COS, CH₄ and CH₃D. *Z. physik. Chem.*, B42: 395-421 (1939); *C.A.*, 33: 5734. ThPh

FRANKE, W., and MOENCH, J.

- (F-98) Mechanism of the fission of hypophosphite with deuterium as an indicator. *Ann.*, 550: 1-31 (1941); *C.A.*, 36: 6431. BiC, KiH, Sy

FRANZINI, T.

- (F-99) Diffusion of gases through metals. *Nature*, 135: 308 (1935); C.A., 29: 2802. MeDf
- (F-100) Diffusion of deuterium in metals. *Atti. accad. nazl. Lincei*, 21: 577-580 (1935); C.A., 29: 7743. MeDf
- (F-101) The diffusibility of deuterium in metals. *Nuovo cimento*, 13: 74-78 (1936); C.A., 30: 4737. MeDf

FREDENHAGEN, H.

See also BONHOEFFER, K. F.; FREDENHAGEN, K.

FREDENHAGEN, H., and BONHOEFFER, K. F.

- (F-102) The Cannizzaro reaction in heavy water. *Z. physik. Chem.*, A181: 379-391 (1938); C.A., 32: 4523. InKi, KiL
- (F-103) Hexose rearrangement in heavy water. *Z. physik. Chem.*, A181: 392-405 (1938); C.A., 32: 4059. KiL

FREDENHAGEN, K., and FREDENHAGEN, H.

- (F-104) Determination of the molecular elevations of the boiling point of inorganic and organic compounds in anhydrous hydrofluoric acid (water, deuterium oxide, potassium sulfate, potassium perchlorate, phenols, ketones and ethers). *Z. anorg. Chem.*, 243: 39-59 (1939); C.A., 34: 4964. ThPh

FREDLUND, E.

- (F-105) Measurements of the radiometer effect at low pressures. *Ann. Physik*, 30: 99-112 (1937); C.A., 31: 8284. ThD

FREDRICKSON, W. R.

See WATSON, W. W.

FREON, P.

- (F-106) Optical rotation of organic D compounds. *J. phys. radium* (8), 1: 374-377 (1940); C.A., 37: 5636. ElRo

FRERICHS, R.

- (F-107) The hydrogen isotope and heavy water. A review. *Naturwissenschaften*, 22: 113-118 (1934); C.A., 28: 3656. Ge
- (F-108) The hydrogen isotope. A review. *Ergeb. exakt. Naturw.*, 13: 257-309 (1934); C.A., 29: 997. Ge

FREUDENBERG, W.

See HAMILL, W. H.

FREYMAN, R.

See CHAMPETIER, G.

FRIEDMAN, I. I.

See REDLICH, O.

FRIEND, J. N

(F-109) Heavy water and water of crystallization. *Nature*, 134: 463 (1934); C.A., 28: 7151. ThPh

FRISH, S. E., and CHERNYAEV, V. I.

(F-110) Methods of the enrichment of hydrogen by the heavy isotope. *Compt. rend. acad. sci. U.R.S.S.*, 3: 245-247 (1934); C.A., 28: 7151. SeDf, SeEl

FRIVOLD, O. E., HASSEL, O., and HETLAND, E.

(F-111) The dispersion curve of hydrogen and deuterium, and of hydrogen sulfide and deuterium sulfide in the visible region. *Physica*, 6: 972-976 (1939); C.A., 34: 2662. ElRf

(F-112) Index of refraction and molar refraction of methane and deuteriomethane. *Physik. Z.*, 40: 29-32 (1939); C.A., 33: 3647. ElRf, Sy

(F-113) Conductivity of sodium chloride and of potassium chloride in deuterium oxide solution. *Avhandl. Norske Videnskaps-Akad. Oslo, I. Mat. Naturv. Klasse No. 3: 14pp.* (1940); C.A., 35: 2055. EcC

FRIVOLD, O. E., HASSEL, O., and RUSTAD, S.

(F-114) Refractive indexes of ordinary and heavy ammonia. *Nature*, 138: 330 (1936); C.A., 30: 7939. ElRf, Sy

(F-115) Index of refraction of heavy ammonia and of heavy hydrogen chloride in the visible region. *Physik. Z.*, 38: 191-195 (1937); C.A., 31: 4902. ElRf

FRIVOLD, O. E., HASSEL, O., and SKJULSTAD, T.

(F-116) Refractive index and molecular refraction of selenium hydride and selenium deuteride. *Physik. Z.*, 37: 134-136 (1936); C.A., 30: 2444. ElRf

FRIVOLD, O. E., and OLSEN, N. G.

(F-117) The magnetic susceptibility of D_2O . *Arch. Math. Naturvidenskab*, 44: 115-122 (1941). *Chem. Zentr. II: 2536* (1941); C.A., 38: 1925. ElMg

FROMAN, D. K.

- (F-118) Deuterium and x-ray absorption. Phys. Rev., 45: 731 (1934);
C.A., 28: 4660. SpX

FROMHERZ, H., SONDERHOFF, R., and THOMAS, H.

- (F-119) A simple method for the determination of the D₂O content of
small quantities of water. Ber., 70B: 1219-1223 (1937);
C.A., 31: 6073. AnDn

FROST, A. A.

See also SELWOOD, P. W.; TAYLOR, H. S.

FROST, A. A., and ALYEA, H. N.

- (F-120) Low pressure explosion limits of deuterium and oxygen. J.
Am. Chem. Soc., 56: 1251-1252 (1934); C.A., 28: 4305.
KiG

FUJIOKA, Y. (HUZIOKA, Y.)

- (F-121) Molecular spectrum of deuterium in the ultraviolet region
and the isotope effect of the normal state of D₂. Z.
Physik, 119: 182-184 (1942); C.A., 37: 5908. SpEl

FUJIOKA, Y., and TANAKA, Y.

- (F-122) Molecular spectra of magnesium deuteride. Sci. Papers
Inst. Phys. Chem. Research Tokyo, 30: 121-137 (1936);
C.A., 30: 8022. SpEl
- (F-123) Molecular spectra of zinc hydride and deuteride. Sci. Pa-
pers Inst. Phys. Chem. Research Tokyo, 32: 143-156
(1937); C.A., 31: 7752. SpEl
- (F-124) Molecular spectra $^2\Pi \rightarrow ^2\Sigma$ of mercury hydride and deuteride.
I. $^2\Sigma$ state. Sci. Papers Inst. Phys. Chem. Research
Tokyo, 34: 713-740 (1938); C.A., 32: 7342. SpEl

FUJIOKA, Y., and WADA, T.

- (F-125) Molecular spectra of heavy hydrogen (HD) in the extreme
ultraviolet region. Sci. Papers Inst. Phys. Chem. Re-
search Tokyo, 27: 210-234 (1935); C.A., 29: 7803. SpEl

FURRY, W. H., and JONES, R. C.

- (F-126) Theory of isotope separation by thermal diffusion: the cylin-
drical case. An abstract. Phys. Rev., 57: 561-562 (1940);
C.A., 35: 4686. SeDf

FURUICHI, J.

See HORI, T.

FUSON, N., RANDALL, H. M., and DENNISON, D. M.

(F-127) Far infrared absorption spectrum and the rotational structure of the heavy water vapor molecule. Phys. Rev., 56: 982-1000 (1939); C.A., 34: 939. SpVi

GABBARD, J. L., and DOLE, M.

- (G-1) A redetermination of the deuterium-protium ratio in normal water. J. Am. Chem. Soc., 59: 181-185 (1937); C.A., 31: 4554. AbG, AnDn, EqH

GABLER, F.

- (G-2) The Faraday effect in heavy water. Physik. Z., 40: 32-33 (1939); C.A., 33: 3647. ElMr

GAERTNER, H.

See ERLENMEYER, H.; HAGENBACH, A.; McDOUGALL, E. J.

GALLAWAY, W. S., and BARKER, E. F.

- (G-3) Infrared absorption spectra of ethylene and tetradeuterio-ethylene under high resolution. J. Chem. Phys., 10: 88-97 (1942); C.A., 36: 1847. SpVi

GARBATSKI, U.

See FARKAS, L.

GASPART, R.

See ERRERA, J.

GASSMANN, A. G., HOCHANADEL, C. J., and HARTMAN, R. J.

- (G-4) Evidence of deuterium exchange in the system $\text{DCl}-\text{CH}_3\text{OH}$. J. Am. Chem. Soc., 65: 988 (1943); C.A., 37: 3999. KiL

GAW, H. Z.

- (G-5) Physiology of the contractile vacuole in ciliates. IV. The effect of heavy water. Arch. Protistenk., 87: 213-224 (1936); C.A., 33: 757. BiZ

See also BARNES, T. C.

GEIB, K. H.

- (G-6) The velocities of the exchange reactions of resorcinol and pyrogallol in heavy water. *Z. physik. Chem.*, A180: 211-232 (1937); C.A., 32: 28. KiL
- (G-7) Chemical reactions of atomic deuterium. A review. *Z. Elektrochem.*, 44: 81-88 (1938); C.A., 32: 2411. KiG, KiH
- (G-8) The exchange of hydrogen ions between hydrogen sulfide and methanol. *Z. Elektrochem.*, 45: 648-650 (1939); C.A., 34: 311. EqL

See also BOK, L. D. C.

GEIB, K. H., and BONHOEFFER, K. F.

- (G-9) The uptake of heavy hydrogen in growing organisms. III. *Z. physik. Chem.*, A175: 459-468 (1936); C.A., 30: 6014. BiB, EqL

GEIB, K. H., and LENDLE, A.

- (G-10) The rate of the reaction $D_2 + I_2$. *Z. physik. Chem.*, B32: 463-470 (1936); C.A., 30: 5091. KiH

GEIB, K. H., and STEACIE, E. W. R.

- (G-11) Exchange reactions with deuterium atoms. *Z. physik. Chem.*, B29: 215-224 (1935); C.A., 29: 7141. EqH, KiH
- (G-12) Exchange reactions involving atomic deuterium. *Trans. Roy. Soc. Can.* (3) 29, III: 91-103 (1935); C.A., 30: 2434. EqG, KiG, KiH

GEROE, L.

- (G-13) Dissociation scheme of several diatomic hydride and deuteride molecules. *Physica*, 7: 155-168 (1940); C.A., 34: 3172. SpEl
- (G-14) The band spectrum of the CD molecule. *Z. Physik*, 117: 709-721 (1941); C.A., 36: 4414. SpEl

GEROE, L., and SCHMID, R.

- (G-15) The dissociation scheme for the diatomic hydrides and deuterides. *Z. Physik*, III: 588-595 (1939); C.A., 33: 6154. SpEl
- (G-16) Dissociation scheme of the diatomic hydrides and deuterides. II. *Z. Physik*, 115: 47-52 (1940); C.A., 34: 5347. SpEl

GEROE, L., and SCHMID, R. (Continued)

- (G-17) Rotational analysis, perturbation and predissociation in the CD and CH bands. *Phys. Rev.*, 59: 528-529 (1941); *C.A.*, 35: 3167. SpEl
- (G-18) Vibrational analysis of CD and CH bands in the region of 2260-2500 Å. *Phys. Rev.*, 60: 363 (1941); *C.A.*, 35: 6867. SpEl, SpVi
- (G-19) Isotope effect in the predissociation phenomena of the CH and CD molecules. *Phys. Rev.*, 60: 911-912 (1941); *C.A.*, 36: 966. SpEl
- (G-20) The group of isolated lines in the 4300 Å. bands of the CH and CD spectra. *Naturwissenschaften*, 29: 239 (1941); *C.A.*, 36: 6899. SpEl

GIBBS, R. C., and WILLIAMS, R. C.

- (G-21) The electronic atomic weight and e/m ratio. *Phys. Rev.*, 44: 1029 (1933); *C.A.*, 28: 1263. SpA
- (G-22) "Doublet" intervals for $H^1\alpha$ and $H^2\alpha$. *Phys. Rev.*, 45: 221 (1934); *C.A.*, 28: 2613. SpA
- (G-23) The e/m ratio as determined from the interval between corresponding components of $H\alpha$ - lines and $D\alpha$ - lines. *Phys. Rev.*, 49: 416 (1936); *C.A.*, 31: 5676. SpA

See also SHAW, R. W.; WILLIAMS, R. C.

GIBNEY, R. B.

See DOLE, M.

GIER, J. de

See ZEEMAN, P.

GIGUERE, P. A., and MAASS, O.

- (G-24) The heterogeneous catalytic decomposition of hydrogen peroxide in heavy water. *Can. J. Research*, 18 B: 84-89 (1940); *C.A.*, 34: 2689. ThF

GILFILLAN, E. S., Jr.

- (G-25) The isotopic composition of sea water. *J. Am. Chem. Soc.*, 56: 406-408 (1934); *C.A.*, 28: 2609. KiH, ThF
- (G-26) Effect of fractional crystallization on the isotopic composition of water. *J. Am. Chem. Soc.*, 56: 2201 (1934); *C.A.*, 28: 7087. AbG, AnDn

GILFILLAN, E. S., Jr., and POLANYI, M.

- (G-27) Micropycnometer for the determination of differences in the isotopic ratio of water. *Z. physik. Chem.*, A166: 254-256 (1933); C.A., 28: 377. AnDn, SeCr

GILLESPIE, B.

See REYERSON, L. H.

GILLESPIE, L. J., and DOWNS, W. R.

- (G-28) The palladium-deuterium equilibrium. *J. Am. Chem. Soc.*, 61: 2496-2502 (1939); C.A., 33: 8483. AdG

GILMAN, H.

See KEIL, H. L.

GINSBURG, N.

See also BARKER, E. F.

GINSBURG, N., and BARKER, E. F.

- (G-29) Infrared absorption spectrum of methyl deuteride. *J. Chem. Phys.*, 3: 668-674 (1935); C.A., 30: 381. AdG, SpVi

GLEAVE, J. L.

See ANGUS, W. R.

GLOCKLER, G., and DAVIS, H. M.

- (G-30) The acetylene bond frequency in heavy acetylene (C_2H_2). *Phys. Rev.*, 46: 535 (1934); C.A., 28: 7159. SpVi

GLOCKLER, G., and MORRELL, C. E.

- (G-31) Symmetric C-D bond vibration in heavy acetylene. *Phys. Rev.*, 47: 569 (1935); C.A., 29: 3601. SpVi
- (G-32) Raman effect of acetylenes. II. Diiodoacetylene, liquid acetylene and deuterioacetylenes. *J. Chem. Phys.*, 4: 15-22 (1936); C.A., 30: 1659. EqG, SpVi, ThF

GLOCKLER, G., and WALL, F. T.

- (G-33) The Raman effect of deuterioammonia. *J. Phys. Chem.*, 41: 143-147 (1937); C.A., 31: 2515. SpVi

GODCHOT, M., CAIQUIL, G., and CALAS, R.

- (G-34) Deuteriohydrates of krypton and xenon. *Compt. rend.*, 202: 759-760 (1936); C.A., 30: 7018. ThPh

GOEHRING, M.

See STAMM, H.

GOLDFINGER, P., and JEUNEHOMME, W.

- (G-35) Hydration of the ion D^+ in heavy water and the dissociation of the deuterio acids. *Compt. rend.*, 200: 1387-1389 (1935); *C.A.*, 29: 3883. EqI, ThF

GOLDFINGER, P., and LASAREFF, W.

- (G-36) Reaction of amines with heavy water. *Compt. rend.*, 200: 1671-1673 (1935); *C.A.*, 29: 5069. EqL

GOLDFINGER, P., and SCHEEPERS, L.

- (G-37) Micro method for the determination of heavy water. *Compt. rend.*, 198: 1916-1918 (1934); *C.A.*, 28: 4660. AnDn
- (G-38) The systematic calculation and the technic of the preparation of heavy water. *J. Chim. phys.*, 31: 628-646 (1934); *C.A.*, 29: 2841. SeEl

GOLDWASSER, S.

See BEEBE, R. A.; SOLLER, T.

GORBOV, A. I.

See VERSCHAGIN, G. V.

GORDON, R. R.

See BAILEY, C. R.

GORDY, W.

- (G-39) Association of unlike molecules through hydrogen bonds. *Nature*, 142: 831 (1938); *C.A.*, 33: 2003. SpVi
- (G-40) Infrared absorption studies of hydrogen bonds between unlike molecules. *J. Am. Chem. Soc.*, 60: 605-612 (1938); *C.A.*, 32: 4877. SpVi
- (G-41) Spectroscopic comparison of the proton-attracting properties of liquids. *J. Chem. Phys.*, 7: 93-99 (1939); *C.A.*, 33: 2396. EqI, SpVi
- (G-42) Spectroscopic evidence of hydrogen bonds. Comparison of proton-attracting properties of liquids. IV. *J. Chem. Phys.*, 9: 215-223 (1941); *C.A.*, 35: 3171. InSt, SpVi
- (G-43) Spectroscopic evidence of hydrogen bonds. Comparison of proton-attracting properties of liquids. IV. Erratum. *J. Chem. Phys.*, 9: 440 (1941); *C.A.*, 35: 3901. InSt, SpVi

GORDY, G., and STANFORD, S. C.

- (G-44) Spectroscopic evidence for hydrogen bonds: comparison of proton-attracting properties of liquids. II. J. Chem. Phys., 8: 170-177 (1940); C.A., 34: 1562. InSt, SpVi
- (G-45) Spectroscopic evidence for hydrogen bonds: comparison of proton-attracting properties of liquids. III. J. Chem. Phys., 9: 204-214 (1941); C.A., 35: 3170. InSt, SpVi

GORIN, E., KAUZMANN, W., WALTER, J., and EYRING, H.

- (G-46) Reactions involving hydrogen and the hydrocarbons. J. Chem. Phys., 7: 633-645 (1939); C.A., 33: 8094. KiG

GORTNER, R. A.

- (G-47) A suggestion regarding the chemical formulas of compounds containing hydrogen and oxygen isotopes. Science, 79: 203-204 (1934); C.A., 28: 4660. No
- (G-48) Water in its biochemical relationships. Ann. Rev. Biochem., 3: 1-22 (1934); C.A., 28: 5841. BiB, BiC, BiZ

GOTO, K., and OKABE, K.

- (G-49) Comparison of the densities of water from various places on the earth. Bull. Chem. Soc. Japan, 15: 76-81 (1940); C.A., 34: 4949. AbG, AnDn

GOUDEKET, M.

See MICHELS, A.

GOULD, A. J.

See also BLEAKNEY, W.

GOULD, A. J., and BLEAKNEY, W.

- (G-50) Possibility of interchange between deuterium gas and hydrogen in compounds. J. Am. Chem. Soc., 56: 247-248 (1934); C.A., 28: 1599. EqH

GOULD, A. J., BLEAKNEY, W., and TAYLOR, H. S.

- (G-51) Interrelations of hydrogen and deuterium molecules. J. Chem. Phys., 2: 362-373 (1934); C.A., 28: 5328. AnMs, EqG, SeAd, SeDf

GRACE, N. S.

- (G-52) Atomic weights of H^2 and Be^9 . J. Am. Chem. Soc., 54: 2562-2563 (1932); C.A., 26: 3987. NuM

See also SPEDDING, F. H.

GRAFE, D., CLUSIUS, K., and KRUIS, A.

- (G-53) Measurement and statistical calculation of the equilibrium
 $D_2 + H_2S \rightleftharpoons H_2 + D_2S$. Z. physik. Chem., B43: 1-19 (1939);
C.A., 33: 5730. EqG, EqH

GRAFF, M.

See SCHOENHEIMER, R.

GRANT, M.

See KINSEY, V. E.

GRAY, F. W., and CRUICKSHANK, J. H.

- (G-54) The diamagnetism of light and heavy water. Nature, 135:
268-269 (1935); C.A., 29: 2800. ElMg

GREENE, C. H.

- (G-55) Deuterium, a new tool of chemists. A review. Nucleus, 12:
170-172 (1935); C.A., 31: 6067. Ge

GREENE, C. H., and VOSKUYL, R. J.

- (G-56) Relative proportions of deuterium in some natural hydrogen
compounds. J. Am. Chem. Soc., 56: 1649-1650 (1934);
C.A., 28: 5327. AbG, AbO
- (G-57) The deuterium-protium ratio. I. The densities of natural
waters from various sources. J. Am. Chem. Soc., 61:
1342-1349 (1939); C.A., 33: 8464. AbG, AnDn

GREENHALGH, R. K.

See HORREX, C.

GREENSPAN, J.

See also La MER, V. K.

GREENSPAN, J., La MER, V. K., and LIOTTA, S.

- (G-58) Semimicro gas-evolution apparatus applied to kinetic studies
in heavy water. J. Am. Chem. Soc., 59: 1606-1608 (1937);
C.A., 31: 7702. KiH

GREGOR, H. P.

See VISSCHER, M. B.

GREGORY, H. S.

See NEWELL, W. C.

GREIFF, L. J.

See UREY, H. C.

GRESSLY, E.

See BERNHARD, K.

GREW, K. E.

- (G-59) Thermal diffusion in hydrogen-deuterium mixtures. Proc. Roy. Soc. London, A178: 390-399 (1941); C.A., 36: 12. SeDf

GREW, K. E., and ATKINS, B. E.

- (G-60) Thermal diffusion in deuterium mixtures. Proc. Phys. Soc. London, 48: 415-420 (1936); C.A., 30: 5091. SeDf

GRINFELD, R.

- (G-61) The isotope effect in molecular spectra. A review. Anales soc. cient. argentina, 134: 9-53 (1942); C.A., 36: 6894. SpEl

GROENEVELD, C.

- (G-62) Heavy hydrogen. A review. Chem. Weekblad, 31: 54-60, 118-124 (1934); C.A., 28: 5754. Ge

GROSS, P.

- (G-63) The dissociation constants of acids in mixtures of light and heavy water. Z. Elektrochem., 44: 299-301 (1938); C.A., 32: 6133. EqI

See also FINK, A.; HALPERN, O.

GROSS, P., and STEINER, H.

- (G-64) Rate of reaction of deuterium with hydrogen chloride. J. Chem. Phys., 4: 165-169 (1936); C.A., 30: 2830. AnTh, EqG, KiG

GROSS, P., STEINER, H., and KRAUSS, F.

- (G-65) The decomposition of diazoacetic ester catalyzed by protons and deuterons. Trans. Faraday Soc., 32: 877-879 (1936); C.A., 30: 5864. KiL
- (G-66) Decomposition of diazoacetic ester catalyzed by protons and deuterons. II. Trans. Faraday Soc., 34: 351-356 (1938); C.A., 32: 2816. KiL

GROSS, P., STEINER, H., and SUESS, H.

- (G-67) The inversion of cane sugar in mixtures of light and heavy water. *Trans. Faraday Soc.*, 32: 883-889 (1936); C.A., 30: 5864. ElRo, EqL, InKi, KiL

GROSS, P., SUESS, H., and STEINER, H.

- (G-68) The dependence of the rate of sucrose inversion on the heavy-water content of water. *Naturwissenschaften*, 22: 662 (1934); C.A., 29: 669. KiL

GROSS, P., and WISCHIN, A.

- (G-69) The distribution of picric acid between benzene and mixtures of light and heavy water. *Trans. Faraday Soc.*, 32: 879-883 (1936); C.A., 30: 5857. ThPh

GROSS, P. M.

See VERMILLION, H. C.

GROTH, W., and HARTECK, P.

- (G-70) Experiments on separation of isotope molecules in a direct-current glow discharge. *Naturwissenschaften*, 27: 390-391 (1939); C.A., 33: 8102. ElGd

GROVES, L. G., and SUGDEN, S.

- (G-71) Dipole moments of vapors. II. *J. Chem. Soc.*, 1935: 971-974; C.A., 29: 7726. ElD

GRUBB, A. C.

See VAN CLEAVE, A. B.

GRUNDSTROEM, B.

- (G-72) The band spectra of calcium hydride. III. *Z. Physik*, 95: 574-587 (1935); C.A., 29: 7185. SpEl
- (G-73) The fine structure of the C bands of calcium hydride-d. *Z. Physik*, 97: 171-176 (1935); C.A., 30: 380. SpEl

GUENTHER, G.

See also BONHOEFFER, K. F.

GUENTHER, G., and BONHOEFFER, K. F.

- (G-74) The fixation of heavy hydrogen in growing organisms. *Z. physik. Chem.*, A180: 185-210 (1937); C.A., 32: 597. BiB, EqQ
- (G-75) Introduction of heavy hydrogen into growing organisms. VI. Biological fat synthesis. *Z. physik. Chem.*, A183: 1-8 (1938); C.A., 33: 650. BiB, BiZ

GUENTHERSCHULZE, A.

- (G-76) Comparison of the sputtering of copper in light with that in heavy hydrogen. *Z. Physik*, 106: 371-372 (1937); *C.A.*, 31: 8353. MeDf

GUENTHERSCHULZE, A., BETZ, H., and KLEINWAECHTER, H.

- (G-77) The diffusion of hydrogen and deuterium through iron. I. Iron as a cathode of a glow discharge. *Z. Physik*, 111: 657-679 (1939); *C.A.*, 33: 6137. MeDf

GUENTHERSCHULZE, A., and KELLER, F.

- (G-78) Attempts to increase the heavy hydrogen isotope in water. *Z. Elektrochem.*, 40: 182-183 (1934); *C.A.*, 28: 4660. SeCr, SeEl

GUENTHERSCHULZE, A., and SCHNITGER, H.

- (G-79) Comparative measurement of the constants of the normal cathode fall in light and heavy hydrogen. *Z. Physik*, 103: 491-494 (1936); *C.A.*, 31: 2073. ElGd
- (G-80) Comparative measurement of the anode drop and the optical and electrical thickness of the anode-drop region in light and heavy hydrogen. *Z. Physik*, 104: 395-401 (1937); *C.A.*, 31: 3375. ElGd

GUENTHERSCHULZE, A., and WINTER, A.

- (G-81) The diffusion of hydrogen and deuterium through iron. II. Glow discharge in mixtures of hydrogen with other gases. *Z. Physik*, 112: 648-653 (1939); *C.A.*, 33: 8488. ElGd, MeDf

GULDBERG, G.

See DYBING, O.

GUNTSCHE, A.

- (G-82) The ultraviolet band spectrum of magnesium hydride and magnesium deuteride. *Z. Physik*, 93: 534-538 (1935); *C.A.*, 29: 3234. SpVi

GUTSCHMIDT, H.

See CLUSIUS, K.

GWATHMEY, E.

See HALPERN, O.

HAANTJES, J.

- (H-1) The hydrogen atom of mass two. A review. Nederland. Tijdschr. Natuurk., 1: 33-40 (1934); C.A., 28: 6061. Ge

See also KEESOM, W. H.

HABLUETZEL, J.

- (H-2) Heavy Seignette salt; dielectric investigations on $\text{KNaC}_4\text{H}_2\text{D}_2\text{O}_6 \cdot 4\text{D}_2\text{O}$ crystals. Helv. Phys. Acta, 12: 489-510 (1939); C.A., 34: 5712. ElD, ElMg, Sy

HACKH, I. W. D., and WESTLING, E. N.

- (H-3) A possible cause of old age. Science, 79: 231 (1934). BiZ

HACKSPILL, L., and BOROCCO, A.

- (H-4) Combinations of deuterium with alkali metals. Compt. rend., 204: 1475-1477 (1937); C.A., 31: 4916. Sy
- (H-5) The preparation of alkali deuterides and a comparison of their dissociation pressures with those of the corresponding hydrides. Bull. soc. chim., 6: 91-103 (1939); C.A., 33: 4854. EqH, Sy

HAFFTER, C.

See VERZAR, F.

HAGENBACH, A.

- (H-6) (Magnetic) rotation dispersion of deuterium oxide in the ultraviolet. Helv. Phys. Acta, 9: 582-586 (1936); C.A., 31: 607. ElMr

HAGENBACH, A., and GAERTNER, H.

- (H-7) Spectroscopic determination of the mass of deuterium from the Balmer series. Helv. Phys. Acta, 8: 314-315 (1935). SpA

HAHN, L., and HEVESY, G. von

- (H-8) Rate of penetration of ions through capillary walls. *Acta Physiol. Scand.*, 1: 347-361 (1941); *C.A.*, 35: 4082. InBi

HAHN, O.

- (H-9) The chemical elements and atoms from the standpoint of isotope investigation (report on the work from the end of 1931 to the end of 1932). *Ber.*, 66A: 1-14 (1933); *C.A.*, 27: 895. Ge
- (H-10) Isotope report. The chemical elements and atom species according to isotope investigations (report on the work from the end of 1932 to the end of 1933). *Ber.*, 67A: 1-8 (1934); *C.A.*, 28: 1265. Ge
- (H-11) The chemical elements and atom species on the basis of isotope investigations (report on the work from the end of 1933 to the end of 1934). A review. *Ber.*, 68A: 1-15 (1935); *C.A.*, 29: 2073. Ge

HALE, J. B.

See ANGUS, W. R.; BAILEY, C. R.

HALFORD, J. O.

- (H-12) Hydrogen isotope exchange reaction. *J. Chem. Phys.*, 8: 243-247 (1940); *C.A.*, 34: 2710. EqH, EqL

See also ANDERSON, L. C.; BATES, J. R.

HALFORD, J. O., and ANDERSON, L. C.

- (H-13) Organic deuterium compounds. Acetic, malonic and succinic acids. *J. Am. Chem. Soc.*, 58: 736-740 (1936); *C.A.*, 30: 4816. Sy, ThPh

HALFORD, J. O., ANDERSON, L. C., and BATES, J. R.

- (H-14) Introduction of deuterium atoms into acetone. *J. Am. Chem. Soc.*, 56: 491-492 (1934); *C.A.*, 28: 1661. EqL, EqQ

HALFORD, J. O., ANDERSON, L. C., BATES, J. R., and SWISHER, R. D.

- (H-15) Exchange reaction between acetone and deuterium oxide. Kinetics and equilibrium. *J. Am. Chem. Soc.*, 57: 1663-1665 (1935); *C.A.*, 29: 7768. EqL, KiL, ThF

HALFORD, J. O., ANDERSON, L. C., and KISSIN, G. H.

- (H-16) Raman spectra of the methyl alcohols, CH_3OH , CH_3OD and CH_2DOD . J. Chem. Phys., 5: 927-932 (1937); C.A., 32: 427. SpV

HALFORD, J. O., and PECHERER, B.

- (H-17) Exchange of deuterium between methanol and water; vibrations of the hydroxyl group in methanol and methanol-d: the entropy of methanol. J. Chem. Phys., 6: 571-575 (1938); C.A., 32: 8892. EqL, ThF

HALL, N. F., BOWDEN, E., and JONES, T. O.

- (H-18) Exchange reactions of hydrogen atoms. J. Am. Chem. Soc., 56: 750 (1934); C.A., 28: 2989. EqQ

HALL, N. F., and JONES, T. O.

- (H-19) Isotopic fractionation of water by distillation. J. Am. Chem. Soc., 56: 749-750 (1934); C.A., 28: 2989. AnDn, AnRf, SeDs
- (H-20) A redetermination of the protium-deuterium ratio in water. J. Am. Chem. Soc., 58: 1915-1919 (1936); C.A., 31: 1282. AbG, AnRf

HALL, N. F., WENTZEL, H. R., and SMITH, T.

- (H-21) Liquid-liquid equilibria involving heavy water. J. Am. Chem. Soc., 56: 1822 (1934); C.A., 28: 5744. ThPh

HALL, W. H.

See also JOHNSTON, H. L.

HALL, W. H., and JOHNSTON, H. L.

- (H-22) Influence of combustion conditions on the density of water formed from commercial hydrogen and oxygen. J. Am. Chem. Soc., 58: 1920-1922 (1936); C.A., 31: 5235. EqG, EqQ

HALPERN, O.

- (H-23) Dissociation constants of acids in light and heavy water. J. Chem. Phys., 3: 456-457 (1935); C.A., 29: 6489. EqI

HALPERN, O., and GROSS, P.

- (H-24) Electrolytic separation of hydrogen isotopes. J. Chem. Phys., 3: 452-456 (1935); C.A., 29: 6482. EcP, SeEl

HALPERN, O., and GWATHMEY, E.

- (H-25) Some gas-kinetic properties of light and heavy hydrogen. J. Chem. Phys., 4: 229 (1936); C.A., 30: 2817. MeV

HAMILL, W. H.

- (H-26) Microanalysis for exchangeable hydrogen. J. Am. Chem. Soc., 59: 1152-1153 (1937); C.A., 31: 5294. EqQ
(H-27) Equilibria on protium oxide-deuterium oxide mixtures. J. Am. Chem. Soc., 59: 1492-1494 (1937); C.A., 31: 7314. EcP, EqI
(H-28) Isotopic exchange equilibria. Proc. Indiana Acad. Sci., 48: 110-112 (1938); C.A., 33: 6689. EqL

See also STEKOL, J. A.

HAMILL, W. H., and FREUDENBERG, W.

- (H-29) Quantitative isotopic exchange reactions in the carbohydrate group. J. Am. Chem. Soc., 57: 1427-1430 (1935); C.A., 29: 6575. EqL

HAMILL, W. H., and La MER, V. K.

- (H-30) Influence of D₂O and HDO on the mutarotation of glucose. J. Chem. Phys., 2: 891 (1934); C.A., 29: 3909. ElRo, KiL
(H-31) The mutarotation of glucose in H₂O-D₂O mixtures. J. Chem. Phys., 4: 144-145 (1936); C.A., 30: 2088. ElRo, KiL
(H-32) Sucrose inversion in H₂O-D₂O. J. Chem. Phys., 4: 294 (1936); C.A., 30: 3303. KiL
(H-33) Acid-base catalysis of the mutarotation of glucose in protium oxide-deuterium oxide mixtures. J. Chem. Phys., 4: 395-401 (1936); C.A., 30: 5865. KiL

HAMMETT, F. S.

See also BARBOUR, H. G.

HAMMETT, F. S., and BARBOUR, H. G.

- (H-34) Retardation of growth of *Obelia geniculata* by deuterium oxide. Growth, 3: 403-408 (1940); C.A., 34: 4469. Bi

HANSEN, K.

See also DYBING, O.

HANSEN, K., and BLEGEN, E.

- (H-35) The effect of deuterium oxide on bacteria. Klin. Wochschr., 14: 1113 (1935); C.A., 29: 7348. BiB

HANSEN, K., and DYBING, O.

- (H-36) Microdetermination of deuterio-alcohol. *Biochem. Z.*, 298: 110-114 (1938); *C.A.*, 33: 88. An
(H-37) Microdetermination of deuterioethyl ether, $C_2D_5OC_2D_5$. *Biochem. Z.*, 301: 225-228 (1939); *C.A.*, 33: 8660. An, Sy

HANSEN, K., and RUSTUNG, E.

- (H-38) Studies on the biological effects of heavy water in warm-blooded animals. I and II. A review. *Klin. Wochschr.*, 14: 1489-1493 (1935); *C.A.*, 30: 2997. BiZ
(H-39) Studies on the biological effects of heavy water in warm-blooded animals. III, IV, V and VI. A review. *Klin. Wochschr.*, 14: 1521-1525 (1935); *C.A.*, 30: 2997. BiZ

HANSEN, K., RUSTUNG, E., and HVEDING, J.

- (H-40) The deuterium oxide (heavy water) content of therapeutically used mineral waters. *Klin. Wochschr.*, 14: 684-685 (1935); *C.A.*, 29: 5594. AbG, An
(H-41) Detection of heavy water in French and some other (Norway, Sweden) mineral waters. *J. pharm. chim.*, 21: 538-541 (1935); *C.A.*, 30: 1158. AbG

HANSEN, K., and WUELFERT, K.

- (H-42) The effect of deuterium oxide on growth of young animals. *Arch. exptl. Path. Pharmacol.*, 190: 671-680 (1938); *C.A.*, 33: 7380. BiZ

HANSGIRG, F.

See PATENTS, BRITISH, GERMAN, U.S.

HANSON, W. T., Jr.

See LEWIS, G. N.

HARADA, M.

- (H-43) The determination of the deuterium content of dilute heavy water by the floating method. *J. Chem. Soc. Japan*, 56: 811-818 (1935); *C.A.*, 29: 7219. AnDn
(H-44) The isotopic exchange reactions between carbohydrates and heavy water. *J. Chem. Soc. Japan*, 57: 391-400 (1936); *C.A.*, 30: 5860. EqL, EqQ

See also KOIZUMI, M.; OKABE, K.; TITANI, T.

HARADA, M., and TITANI, T.

- (H-45) The concentration of deuterium in some industrial waters. Bull. Chem. Soc. Japan, 9: 457-459 (1934); C.A., 29: 1018. AbG
- (H-46) The isotopic fractionation of water by distillation. Bull. Chem. Soc. Japan, 10: 39-40 (1935); C.A., 29: 2841. SeDs
- (H-47) Isotopic composition of rain and snow water. Bull. Chem. Soc. Japan, 10: 206 (1935); C.A., 29: 6139. AbG
- (H-48) Isotopic composition of rain and snow water. Bull. Chem. Soc. Japan, 10: 263-266 (1935); C.A., 29: 7793. AbG
- (H-49) Isotopic exchange between water and several organic compounds. Bull. Chem. Soc. Japan, 10: 554-557 (1935); C.A., 30: 2082. EqL, EqQ
- (H-50) The velocity of the exchange reaction of hydrogen atoms between sugar and water. Bull. Chem. Soc. Japan, 11: 55-56 (1936); C.A., 30: 4076. KiL
- (H-51) Isotopic exchange between water and several organic compounds. Bull. Chem. Soc. Japan, 11: 465-474 (1936); C.A., 30: 7977. EqL, EqQ
- (H-52) The isotope exchange between aniline hydrochloride and heavy water. Bull. Chem. Soc. Japan, 11: 554-556 (1936); C.A., 31: 97. EqL

HARASIMA, A.

- (H-53) Calculation of the surface energies of several liquids. Proc. Phys. Math. Soc. Japan, 22: 825-840 (1940); C.A., 35: 2047. MeSt

HARDER, A.

See ZINTL, E.

HARDING, J.

See DITCHBURN, R. W.

HARDY, J. D., BARKER, E. F., and DENNISON, D. M.

- (H-54) The infrared spectrum of H^2Cl . Phys. Rev., 42: 279-289 (1932); C.A., 27: 21. SpVi

HARKINS, W. D.

- (H-55) Nomenclature for the isotopes of hydrogen (proto- and deuterium) and their compounds. Science, 79: 138-140 (1934); C.A., 28: 1599. No

HARKINS, W. D. (Continued)

- (H-56) Heavy hydrogen and the work of Harold C. Urey. A review. Chem. Bull. Chicago, 21: 83-87 (1934); C.A., 28: 2989. Ge

HARKINS, W.D., and DOEDE, C.

- (H-57) Apparatus for the separation of isohydrogen (deuterium) oxide by electrolysis. J. Am. Chem. Soc., 55: 4330-4331 (1933); C.A., 27: 5636. SeEl

HARMSEN, H., HERTZ, G., and SCHUETZE, W.

- (H-58) The separation of isotopes. Preparation of pure heavy hydrogen by diffusion. Z. Physik, 90: 703-711 (1934); C.A., 28: 7151. SeDf

HARNWELL, G. P.

- (H-59) Source for the Balmer series of hydrogen and deuterium. Am. J. Phys., 3: 185 (1935). SpA

HARNWELL, G. P., SMYTH, H. D., VAN VOORHIS, S. N., and KUPER, J. B. H.

- (H-60) The production of H^3 by a canal-ray discharge in deuterium. Phys. Rev., 45: 655-656 (1934); C.A., 28: 4306. NuR

HARRIS, L.

See also LUHR, O.

HARRIS, L., JOST, W., and PEARSE, R. W. B.

- (H-61) Separation of hydrogen isotopes by diffusion through palladium. Proc. Natl. Acad. Sci. U.S., 19: 991-994 (1933); C.A., 28: 1265. MeDf, SeDf

HARTECK, P.

- (H-62) Preparation of heavy hydrogen. Proc. Phys. Soc. London, 46: 277-280 (1934); C.A., 28: 2989. SeEl
- (H-63) Heavy hydrogen. A review. Scientia Milan, 56: 326-335 (1934); C.A., 29: 999. Ge
- (H-64) Chemistry of the deuterio compounds. Symposium of the German Bunsen Society, Sept. 28-29, 1937. Determination of heavy hydrogen. Z. Elektrochem., 44: 3-8 (1938); C.A., 32: 2410. An

See also EDSE, R.; FARKAS, A.; GROTH, W.

HARTMAN, R. J.

See GASSMANN, A. G.

HARTMANN, J. U.

- (H-65) Abhandlung ueber die Problems: Schweres Wasser, schwerer Wasserstoff und Schwerkraft. Versuch einer Synthese vom Standpunkt der Authertheorie. 17 pp., Chur. Switz. Selbst-verlag des Verfassers., 1934; C.A., 28: 4665. Ge

HARVEY, E. N.

- (H-66) Biological effects of heavy water. Biol. Bull., 66: 91-96 (1934); C.A., 28: 4440. Bi
- (H-67) The mechanism and kinetics of bioluminescent reactions. Cold Spring Harbor Symposia Quant. Biol., 3: 261-265 (1935); C.A., 30: 7596. KiP

See also ANDERSON, R. S.; LUCKÉ, B.; TAYLOR, G. W.

HARVEY, E. N., and TAYLOR, G. W.

- (H-68) The oxygen consumption of luminous bacteria in water containing deuterium oxide. J. Cellular Comp. Physiol., 4: 357-362 (1934); C.A., 28: 5483. BiB

HASSEL, O.

See FRIVOLD, O. E.

HASUNUMA, H.

- (H-69) Stark effect in α -diagonal bands of HD and D₂. Proc. Phys. Math. Soc. Japan, 18: 469-489 (1936); C.A., 31: 2095. SpE1

HAUROWITZ, F. .

See MUENZBERG, F. K.

HAYNES, F. B.

See BEAMS, J. W.

HAZELTON, C. L.

See CURRY, J.

HEATH, H. R., IBBS, T. L., and WILD, N. E.

- (H-70) The diffusion and thermal diffusion of hydrogen-deuterium with a note on the thermal diffusion of hydrogen-helium.

HEATH, H. R., IBBS, T. L., and WILD, N. E. (Continued)

Proc. Roy. Soc. London, A178: 380-389 (1941); C.A., 36: 12. MeDf, SeDf

HEIMER, A.

(H-71) The isotope effect in bismuth hydride (BiH/BiD). Naturwissenschaften, 23: 287 (1935); C.A., 29: 5743. SpEl

(H-72) The band spectrum of bismuth deuteride. Z. Physik, 103: 621-626 (1936); C.A., 31: 2927. SpEl

HEIMER, T.

(H-73) The isotope effect of copper hydride (CuH/CuD). Naturwissenschaften, 23: 372 (1935); C.A., 29: 7185. SpEl

(H-74) The isotope effect of gold hydride (AuH/AuD). Naturwissenschaften, 24: 78 (1936); C.A., 30: 4399. SpEl

(H-75) The term scheme of gold deuteride (preliminary notice). Z. Physik, 101: 121-128 (1936); C.A., 30: 7031. SpEl

HEIN, F., and BAEHR, G.

(H-76) Solubility and color of silver permanganate in heavy water. Z. physik. Chem., B38: 270-274 (1937); C.A., 32: 1544. SoH

HELLUND, E. J.

(H-77) Isotope separation by transient pressure diffusion. Phys. Rev., 57: 743-744 (1940); C.A., 34: 4659. SeDf

HELLWEGE, K. H.

(H-78) Investigations in the long-wave infrared concerning combination oscillations and the existence of metal hydrate complexes in crystals. Ann. Physik, 34: 521-540 (1939); C.A., 33: 4520. SpVi

HEMPTINNE, M. de, and DELFOSSE, J. M.

(H-79) The Raman spectra of light and heavy phosphine. Bull. sci. acad. roy. Belg., 21: 793-799 (1935); C.A., 30: 962. SpVi, Sy

(H-80) Raman spectrum of light and heavy phosphine and arsine. Ann. soc. sci. Bruxelles, 56B: 373-383 (1936); C.A., 31: 2512. SpVi, Sy

HEMPTINNE, M. de, JUNGERS, J. C., and DELFOSSE, J. M.

(H-81) Raman spectra of deuterioethylenes. Nature, 140: 323 (1937); C.A., 31: 7757. SpVi, Sy

HEMPTINNE, JUNGERS, and DELFOSSE (Continued)

- (H-82) Raman spectra of deuterioethylenes. *J. Chem. Phys.*, 6: 319-324 (1938); *C.A.*, 32: 6153. SpVi

HEMPTINNE, M. de, and VELGHE, C.

- (H-83) Raman spectra of deuterioethyl and deuterioethylene bromides. *Physica*, 5: 958-960 (1938); *C.A.*, 33: 2035. SpVi, Sy

HENNAUT-ROLAND, Mme.

See TIMMERMANS, J.

HERMAN, R. C.

- (H-84) Vibration spectra and molecular structure. IX. Further studies of the vapors of the fatty acid series. *J. Chem. Phys.*, 8: 252-258 (1940); *C.A.*, 34: 2705. SpVi

See also WILLIAMS, V.

HERMAN, R. C., and HOFSTADTER, R.

- (H-85) Infrared absorption spectrum of heavy acetic acid. *J. Chem. Phys.*, 6: 110 (1938); *C.A.*, 32: 2430. SpVi
- (H-86) Vibration spectra and molecular structure. V. Infrared studies on light and heavy acetic acids. *J. Chem. Phys.*, 6: 534-540 (1938); *C.A.*, 32: 8269. SpVi
- (H-87) Vibration spectra and molecular structure. VII. Further infrared studies on the vapors of some carboxylic acids. *J. Chem. Phys.*, 7: 460-464 (1939); *C.A.*, 33: 6718. SpVi

HERMAN, R. C., and WILLIAMS, V.

- (H-88) Note on the infrared absorption spectra of the vapors of DCOOH and DCOOD. *J. Chem. Phys.*, 8: 447-449 (1940); *C.A.*, 34: 4989. SpVi, Sy

HERR, D. S., MATHESON, M. S., and WALTERS, W. D.

- (H-89) The photochemical decomposition of acetone in the presence of deuteriobiacetyl. *J. Am. Chem. Soc.*, 63: 1464-1468 (1941); *C.A.*, 35: 4286. KiP, Sy

HERRMANN, J. B.

- (H-90) The pharmacological action of deuterium oxide. VIII. Action on the central nervous system. *J. Pharmacol. Exptl. Therap.*, 67: 265-275 (1939); *C.A.*, 34: 517. BiZ

See also BARBOUR, H. G.

HERRMANN, J. B., and BARBOUR, H. G.

- (H-91) Catatonia produced by the introduction of heavy water into the cerebrospinal fluid. *Science*, 86: 244-245 (1937); *C.A.*, 31: 8001. BiZ

HERSZFINKIEL, H., ROTBLAT, J., and ZYW, M.

- (H-92) Loss of velocity of neutrons in heavy water. *Nature*, 135: 653-654 (1935); *C.A.*, 29: 4257. NuR

HERTZ, G.

- (H-93) Manufacture of pure heavy hydrogen isotope by diffusion. *Naturwissenschaften*, 21: 884-885 (1933); *C.A.*, 28: 2264. SeDf
- (H-94) A method of separating isotope mixtures by diffusion through streaming mercury vapor. *Z. Physik*, 91: 810-815 (1934); *C.A.*, 29: 677. SeDf

See also HARMSSEN, H.

HERZBERG, G., PATAT, F., and SPINKS, J. W. T.

- (H-95) Bands of "heavy" acetylene in the near infrared. *Nature*, 133: 951 (1934); *C.A.*, 28: 5334. SpVi
- (H-96) Rotation vibration bands in the photographic infrared of molecules containing the hydrogen isotope of mass 2. I. The spectrum of C_2HD and the C-C and C-H distance of acetylene. *Z. Physik*, 92: 87-99 (1934); *C.A.*, 29: 2085. SpVi, Sy

HERZBERG, G., PATAT, F., and VERLEGER, H.

- (H-97) Rotation vibrations in the photographic infrared of molecules which contain the hydrogen isotope of mass 2. II. The C_2HD spectrum and the C-C= and C-H= separation in acetylene (additional data). *Z. Physik*, 102: 1-22 (1936); *C.A.*, 30: 8012. SpVi

HERZBERG, G., and VERLEGER, H.

- (H-98) The spectrum of heavy water in photographic infrared. *Physik. Z.*, 35: 622 (1934); *C.A.*, 28: 6632. SpVi

HERZBERG, L.

- (H-99) Rotation-vibration spectra in the photographic infrared of molecules which contain the hydrogen isotope of mass 2. III. The band 1.161μ of HDO. *Z. Physik*, 107: 549-558 (1937); *C.A.*, 32: 2026. SpVi

HETLAND, E.

See FRIVOLD, O. E.

HEVESY, G. von

- (H-100) Heavy hydrogen in biology. *Naturwissenschaften*, 23: 775-780 (1935); *C.A.*, 30: 1074. Bi

See also HAHN, L.

HEVESY, G. von, and HOFER, E.

- (H-101) Diplogen (deuterium) and fish. *Nature*, 133: 495-496 (1934); *C.A.*, 28: 4085. BiZ
(H-102) Water exchange in the body of the fish. *Z. physiol. Chem.*, 225: 28-34 (1934); *C.A.*, 28: 4438. BiZ
(H-103) How long does water remain in the human body? (Heavy water as an indicator). *Klin. Wochschr.*, 13: 1524-1526 (1934); *C.A.*, 29: 1152. InBi
(H-104) Elimination of water from the human body. *Nature*, 134: 879 (1934). InBi

HEVESY, G. von, HOFER, E., and KROGH, A.

- (H-105) The permeability of the skin of frogs to water as determined by D₂O and H₂O. *Acta Physiol. Scand.*, 72: 199-214 (1935); *C.A.*, 30: 524. BiZ

HEVESY, G. von, and JACOBSEN, C. P.

- (H-106) Rate of passage of water through capillary and cell walls. *Acta Physiol. Scand.*, 1: 11-18 (1940). InBi

HEYDEN, M.

- (H-107) The fine structure of D α . *Z. Physik*, 106: 499-517 (1937); *C.A.*, 31: 8359. SpA

HEYNINGEN, W. E. van

- (H-108) Stable isotopes as indicators in biology. A review. *Biol. Rev. Cambridge Phil. Soc.*, 14: 420-450 (1939); *C.A.*, 34: 1044. Bi, InBi

See also ROSEBURY, F.

HEYNINGEN, W. E. van, RITTENBERG, D., and SCHOENHEIMER, R.

- (H-109) The preparation of fatty acids containing deuterium. *J. Biol. Chem.*, 125: 495-500 (1938); *C.A.*, 32: 9041. Sy, ThPh

HEYROVSKY, J.

- (H-110) Polarographic studies with the dropping-mercury cathode. LXIX. Hydrogen overvoltage in light and heavy water. Collection Czechoslov. Chem. Commun., 9: 273-301 (1937); C.A., 32: 54. EcO
- (H-111) Polarographic studies with the dropping-mercury cathode. LXX. Hydrogen overvoltage in mixtures of light and heavy water and the separation coefficient. Collection Czechoslov. Chem. Commun., 9: 345-359 (1937); C.A., 32: 54. EcO
- (H-112) The overvoltage of hydrogen upon a mercury cathode in light water and in heavy water. Chem. Listy, 31: 440-447 (1937); C.A., 32: 4884. EcO, EcP
- (H-113) The electrodeposition of hydrogen and deuterium at the dropping-mercury cathode. Chem. Revs., 24: 125-134 (1939); C.A., 33: 5295. EcO

HEYROVSKY, J., and MUELLER, O.H.

- (H-114) Polarographic studies with the dropping-mercury cathode. XLVIII. Overpotential in heavy water. Collection Czechoslov. Chem. Commun., 7: 281-287 (1935); C.A., 29: 6148. EcO

HIGUCHI, I.

- (H-115) The dissociation pressure of $\text{Na}_2\text{SO}_4 \cdot 10\text{D}_2\text{O}$ and the vapor pressure of saturated solutions of Na_2SO_4 , $\text{Na}_2\text{SO}_4 \cdot 7\text{D}_2\text{O}$ and $\text{Na}_2\text{SO}_4 \cdot 10\text{D}_2\text{O}$ in pure heavy water. J. Chem. Soc. Japan, 58: 193-200 (1937); C.A., 31: 3363. ThPh

HILDEBRAND, J. H.

See CLAUSSEN, W. H.; LONG, R. W.

HILLESUND, S.

See VEGARD, L.

HINSHELWOOD, C. N.

See also DANBY, C. J.; DAVOUD, J. G.; MITCHELL, J. W.

HINSHELWOOD, C. N., and MITCHELL, J. W.

- (H-116) The reaction of nitric oxide with hydrogen and with deuterium. J. Chem. Soc., 1936: 378-384; C.A., 30: 4384. KiG

HINSHELWOOD, C. N., WILLIAMSON, A. T., and WOLFENDEN, J. H.

- (H-117) Reaction between oxygen and the heavier isotope of hydrogen.

HINSHELWOOD, WILLIAMSON, and WOLFENDEN (Continued)

Nature, 133: 836-837 (1934); C.A., 28: 4981. KiH

- (H-118) The reaction between oxygen and the heavier isotope of hydrogen. Proc. Roy. Soc. London, A147: 48-57 (1934); C.A., 29: 2057. KiG, KiH, Sy

HIPPLE, J. A., Jr.

See DELFOSSE, J.

HIROTA, K.

See also OKAMOTO, G.

HIROTA, K., and HORIUCHI, J.

- (H-119) Relative catalytic activities of several metals for the isotopic interchange reaction, $\text{H}_2\text{O} + \text{HD} = \text{HDO} + \text{H}_2$. Sci. Papers Inst. Phys. Chem. Research Tokyo, 30: 151-168 (1936); C.A., 31: 310. KiH

HIROTA, K., and OKAMOTO, G.

- (H-120) Interchange equilibrium between acetylene and heavy water. Bull. Chem. Soc. Japan, 11: 349-351 (1936); C.A., 30: 6269. EqG, EqH

HIRSCHFELDER, J. O.

See also HULBERT, H. M.

HIRSCHFELDER, J. O., EYRING, H., and TOPLEY, B.

- (H-121) Reactions involving hydrogen molecules and atoms. J. Chem. Phys., 4: 170-177 (1936); C.A., 30: 2830. KiG

HOARE, F. E.

- (H-122) Diamagnetic susceptibility of heavy water. Nature, 137: 497-498 (1936); C.A., 30: 4061. ElMg

HOBBS, M. E.

- (H-123) The solid state of H_2 , HD and D_2 . J. Chem. Phys., 7: 318-322 (1939); C.A., 33: 5255. ThF

HOBDEN, F. W., JOHNSTON, E. F., WELDON, L. H. P., and WILSON, C. L.

- (H-124) Determination and calculation of the equilibrium constants for isotopic hydrogen exchange in the systems *n*-amyl alcohol-water and ethylthiol-water. Vapor pressures and

HOBDEN, JOHNSTON, WELDON, and WILSON (Continued)

Raman spectra of *n*-amyl deuterioalcohol and ethyl deuteriothiol. J. Chem. Soc., 1939: 61-67. C.A., 33: 5730.
EqI, SpVi, ThPh

HOBERMAN, H. D.

See RITTENBERG, D.

HOCHANADEL, C. J.

See GASSMANN, A. G.

HOCHBERG, J., and BONHOEFFER, K. F.

(H-125) Hydrogen exchange of dimethyl sulfone and sodium-methanesulfonate in alkaline solutions. Z. physik. Chem., A184: 419-428 (1939); C.A., 34: 311. KiL

HOCHBERG, S.

See La MER, V. K.

HOELEMANN, P., and CLUSTIUS, K.

(H-126) Electrolysis of deuterium-containing fatty acids. I. The electrolysis of deuterioacetic acid (acetic-d₃, acid-d). Z. physik. Chem., B35: 261-269 (1937); C.A., 31: 4213. EcO, MeD, Sy

(H-127) Electrolysis of fatty acids containing deuterium. II. The mechanism of ethylene formation by electrolysis of propionic acid. Ber., 70A: 819-827 (1937); C.A., 31: 4906. InKi, Sy

HOFER, E.

See BREUSCH, F.; HEVESY, G. von

HOFSTADTER, R.

(H-128) Vibration spectra and molecular structure. VI. Infrared absorption spectrum of heavy formic acid. J. Chem. Phys., 6: 540-543 (1938); C.A., 32: 8269. SpVi

See also BONNER, L. G.; HERMAN, R. C.; WILLIAMS, V.

HOGAN, M. E., Jr.

See WATSON, W. W.

HOLCOMB, R.

See STEWART, W. W.

HOLDEN, A. N., KOHMAN, G. T., MASON, W. P., and MORGAN, S. O.
(H-129) Heavy water Rochelle salt. Phys. Rev., 56: 378 (1939); C.A.,
33: 8073. Eld

HOLDEN, A. N., and MASON, W. P.

(H-130) The elastic, dielectric and piezoelectric constants of heavy
water Rochelle salt. Phys. Rev., 57: 54-56 (1940); C.A.,
34: 2221. Eld, MeD

HOLMQUIST, R. E.

See NORRIS, W. V.

HOLST, W., and HULTHEN, E.

(H-131) Band spectrum of aluminum deuteride. Nature, 133: 496
(1934); C.A., 28: 3302. SpEl, SpVi

(H-132) Isotope effect in the band spectrum of aluminum hydride.
Nature, 133: 796-797 (1934); C.A., 28: 4661. SpEl

(H-133) Band spectra of aluminum hydride and aluminum deuteride
(aluminum hydride-d). Z. Physik, 90: 712-727 (1934);
C.A., 29: 1008. SpVi

HONDE, E.

See ASADA, T.

HOOD, G. R.

See RICHARDSON, J. S.

HORI, T., and FURUICHI, J. (HURUITI, J.)

(H-134) The isotope effect of ionized mercury hydride ($\text{Hg}^+\text{H}/\text{Hg}^+\text{D}$).
Z. Physik, 101: 279-284 (1936); C.A., 30: 7031. SpVi

HORI, Y.

(H-135) The electrolytic production of heavy water. J. Electrochem.
Assoc. Japan, 2: 290-297 (1934); C.A., 29: 1720. SeEl

HORIUCHI, J. (HORIUTI, I., J., or Z.)

See also CAVANAGH, B.; HIROTA, K.; OKAMOTO, G.

HORIUCHI, J., and IKUSHIMA, M.

(H-136) The mechanism of the hydrogen electrode on platinum.

HORIUCHI, J., and IKUSHIMA, M. (Continued)

Proc. Imp. Acad. Tokyo, 15: 39-44 (1939); C.A., 33: 6166.
EcP, InKi

HORIUCHI, J., and KOYANO, T.

(H-137) The direct introduction of deuterium into benzene by high-frequency current. Bull. Chem. Soc. Japan, 10: 601 (1935); C.A., 30: 2434. Sy

HORIUCHI, J., and KWAN, T.

(H-138) The mechanism of contact hydrogenation of carbonyl groups. Proc. Imp. Acad. Tokyo, 15: 105-109; C.A., 33: 6795. EqH, EqQ, InKi

HORIUCHI, J., OGDEN, G., and POLANYI, M.

(H-139) Catalytic replacement of protium by deuterium in benzene. Trans. Faraday Soc., 30: 663-665 (1934); C.A., 28: 6627. EqH

HORIUCHI, J., and OKAMOTO, G.

(H-140) Isotopic shift of water by distillation. Bull. Chem. Soc. Japan, 10: 503-505 (1935); C.A., 30: 1277. EqH, SeDs

(H-141) The nature of overvoltage and the electrolytic separation of hydrogen isotopes. Sci. Papers Inst. Phys. Chem. Research Tokyo, 28: 231-242 (1936); C.A., 30: 3332. EcO, SeEl

(H-142) Determination of the number of interchangeable hydrogen atoms in complex salts. Sci. Papers Inst. Phys. Chem. Research Tokyo, 31: 205-210 (1937); C.A., 31: 3810. EqL

HORIUCHI, J., and POLANYI, M.

(H-143) A catalyzed reaction of hydrogen with water. Nature, 133: 819 (1933); C.A., 28: 2254. KiH

(H-144) Catalytic hydrogen replacement and the nature of overvoltage. Nature, 133: 142 (1934). EcO

(H-145) Catalytic interchange of hydrogen between water and ethylene and between water and benzene. Nature, 134: 377-378 (1934); C.A., 28: 7132. EqH

(H-146) Exchange reactions of hydrogen in metallic catalysts. Trans. Faraday Soc., 30: 1164-1172 (1934); C.A., 29: 2431. EqH, InKi

(H-147) Direct introduction of deuterium into benzene. Nature, 134: 847 (1934); C.A., 29: 2516. InKi

HORIUCHI, J., and SAKAMOTO, Y.

- (H-148) Isotopic interchange reaction between chloroform and water. Bull. Chem. Soc. Japan, 11: 627-628 (1936); C.A., 31: 4189. KiL

HORIUCHI, J., and SZABO, A. L.

- (H-149) Reaction of heavy water with metallic sodium. Nature, 133: 327-328 (1934). SeCh

HORIUTI, I., HORIUTI, J., HORIUTI, Z.

See HORIUCHI, J.

HORNEL, J. C.

- (H-150) Catalysis of ester hydrolysis by D_3O^+ ions. Nature, 135: 909 (1935); C.A., 29: 5729. KiL

HORNEL, J. C., and BUTLER, J. A. V.

- (H-151) The rates of some acid- and base-catalyzed reactions, and the dissociation constants of weak acids in heavy water. J. Chem. Soc., 1936: 1361-1366; C.A., 31: 309. KiL, MeD

HORNY, H.

See KAILAN, A.

HORREX, C., GREENHALGH, R. K., and POLANYI, M.

- (H-152) Catalytic exchange of hydrogen. Trans. Faraday Soc., 35: 511-520 (1939); C.A., 33: 4858. InKi

HORREX, C., and POLANYI, M.

- (H-153) Atomic interchange between water and saturated hydrocarbons. Mem. Proc. Manchester Lit. Phil. Soc., 80: 33-35 (1935-1936); C.A., 31: 2503. InKi

HOUSTON, W. V.

- (H-154) A new method of analysis of structure of $H\alpha$ and $D\alpha$. Phys. Rev., 51: 446-449 (1937); C.A., 31: 7749. SpA

HOWARD, J. B.

- (H-155) Normal vibration frequencies of ammonia, phosphine and arsine. J. Chem. Phys., 3: 207-211 (1935); C.A., 29: 3601. SpVi

HSU, S.K., INGOLD, C.K., and WILSON, C. L.

- (H-156) Prototropy in relation to the exchange of hydrogen isotopes. III. Comparison of the rates of racemization and of hydrogen exchange in a ψ -acidic ketone. J. Chem. Soc., 1938: 78-81; C.A., 32: 2106. KiL

HUDSON, J.H., and OGDEN, G.

- (H-157) The adsorption of deuterium on some promoted molybdenum oxides. Nature, 142: 476-477 (1938); C.A., 32: 8874. AdG

HUGHES, A.H., YUDKIN, J., KEMP, I., and RIDEAL, E.K.

- (H-158) Some reactions with heavy water. J. Chem. Soc., 1934: 1105-1112; C.A., 28: 6627. BiB, BiC

HUGHES, E.D.

See also DAY, J. N. E.

HUGHES, E.D., INGOLD, C.K., and WILSON, C. L.

- (H-159) Chemical separation of the isotopes of hydrogen. Nature, 133: 291-292 (1934); C.A., 28: 2989. SeCh
- (H-160) The separation of the isotopes of hydrogen by the chemical decomposition of water, and some remarks on the mechanisms underlying the reducing action of dissolving metals. J. Chem. Soc., 1934: 493-498; Chemistry & Industry, 53: 489-490 (1934); C.A., 28: 4306. SeCh
- (H-161) Concentration of heavy water by spontaneous evaporation. Nature, 134: 142 (1934); C.A., 28: 6367. SeDs

HUGUS, L. Z., Jr.

See CURRY, J.

HULBERT, H.M., and HIRSCHFELDER, J. O.

- (H-162) Potential-energy functions for diatomic molecules. J. Chem. Phys., 9: 61-69 (1941); C.A., 35: 1280. SpVi

HULTHEN, E.

- (H-163) The heavy hydrogen isotope. Saertryck ur Svenska Fysikersamfundets publication. Kosmos Swed., 11: 128-140 (1933). Ge
- (H-164) The dissociation scheme of diatomic hydrides and deuterides. Z. Physik, 113: 126-133 (1939); C.A., 33: 8497. SpEl

See also HOLST, W.

HULTHEN, L.

(H-165) Isotope effect in band spectra of hydrides and deuterides.
Nature, 135: 543 (1935); C.A., 29: 3913. SpEl

(H-166) The virtual state of deuteron. Phys. Rev., 61: 671 (1942);
C.A., 36: 4019. NuM

HUMMEL, F.

See BURWELL, R. L., Jr.

HUNT, H.

(H-167) Isotopic fractionation of hydrogen. J. Chem. Phys., 2: 106
(1934); C.A., 28: 2264. SeEl

HUZIOKA, Y.

See FUJIOKA, Y.

HVEDING, J.

See HANSEN, K.

IBBS, T. L.

See HEATH, H. R.

HASHI, S.

See NAKAO, T.

IZIMA, S.

- I-1) Adsorption of deuterium on reduced nickel—studies at low temperatures. Rev. Phys. Chem. Japan, 12: 83-89 (1938); C.A., 33: 1578. AdG

KUSHIMA, M.

See also HORIUCHI, J.

KUSHIMA, M., and AZAKAMI, S.

- I-2) The isotopic interchange equilibrium between heavy water and its vapor. J. Chem. Soc. Japan, 59: 40-46 (1938); C.A., 32: 2831. EqH

MANISHI, S. (IMANISI, S.)

- I-3) Gold deuteride bands. Nature, 139: 591 (1937); C.A., 31: 4204. SpEl
- I-4) The near ultraviolet $^1\Sigma - ^1\Sigma$ band system of gold deuteride and a new analysis of gold hydride spectrum. Sci. Papers Inst. Phys. Chem. Research Tokyo, 31, No. 694: 247-264 (1937); C.A., 31: 6556. SpEl
- I-5) Spectrum of potassium deuteride. Nature, 143: 165-166 (1939); C.A., 33: 2411. SpEl

MASE, H.

See NAKAO, T.

NAI, T.

See TAKEUTI, T.

NDOVINA, R.

- I-6) Surface tension of D_2O and of mixtures of D_2O and H_2O . Ann.

INDOVINA, R. (Continued)

chim. applicata, 30: 51-53 (1940); C.A., 34: 4955. MeD, MeSt

- (I-7) Conductance of electrolytes in heavy water. Ann. chim. applicata, 30: 54-61 (1940); C.A., 34: 6872. EcC

See also OLIVERI-MANDALA, E.

INDOVINA, R., and CITARDA, A.

- (I-8) The action of deuterium oxide on carbohydrate metabolism. Biochim. e terap. sper., 24: 236-247 (1937); C.A., 31: 8560. Bi

- (I-9) The physical, chemical and biological qualities of heavy water. A review. Biochim. e terap. sper., 24: 285-298 (1937); C.A., 32: 404. Ge

INDOVINA, R., and SALEMI, B.

- (I-10) Reaction between ascorbic acid and mercuric chloride in heavy water. Ann. chim. applicata, 30: 62-65 (1940); C.A., 34: 6873. EcC, EqL

INGALLS, E. N.

See WYMAN, J., Jr.

INGOLD, C. K.

- (I-11) The Bakerian lecture. The structure of benzene. Proc. Roy. Soc. London, A169: 149-173 (1938); C.A., 32: 3675. SpVi

INGOLD, C. K., RAISIN, C. G., and WILSON, C. L.

- (I-12) Direct introduction of deuterium into benzene without heterogeneous catalysis. Nature, 134: 734 (1934); C.A., 29: 1072. EqL

- (I-13) Direct introduction of deuterium into the aromatic nucleus. I. Qualitative comparison of the efficiencies of some acidic adulterating agents and of the influence of some aromatic substituents. J. Chem. Soc., 1936: 1637-1643; C.A., 31: 666. EqL

- (I-14) Direct introduction of deuterium into aliphatic systems. I. Hydrogen exchange between sulfuric acid and paraffinoid hydrocarbons. J. Chem. Soc., 1936: 1643-1645; C.A., 31: 653. EqL

INGOLD, C. K., RAISIN, C. G., WILSON, C. L., BAILEY, C. R.; and TOPLEY, B.

- (I-15) Structure of benzene. II. Direct introduction of deuterium into benzene and the physical properties of hexadeuteriobenzene (benzene- d_6), J. Chem. Soc., 1936: 915-925; C.A., 30: 7034. EId, ElRf, MeD, Sy, ThPh

INGOLD, C. K., SALAS, E. de, and WILSON, C. L.

- (I-16) Prototropy in relation to the exchange of hydrogen isotopes. I. Rates of isomerization and of hydrogen isotope exchange in unsaturated nitriles. J. Chem. Soc., 1936: 1328-1334; C.A., 30: 8179. InKi, KiL, MeD, Sy

See also ANGUS, W. R.; BAILEY, C. R.; DAY, J. N. E.; HSU, S. K.; HUGHES, E. D.; INGOLD, E. H.

INGOLD, C. K., and WILSON, C. L.

- (I-17) Structure of benzene. V. Fluorescence spectra of benzene and hexadeuteriobenzene (benzene- d_6) vapor. J. Chem. Soc., 1936: 941-954; C.A., 30: 7034. InSt, SpFl
- (I-18) Structure of benzene. VI. Resonance emission spectrum of benzene and hexadeuteriobenzene (benzene- d_6). J. Chem. Soc., 1936: 955-966; C.A., 30: 7034. SpEl
- (I-19) Exchange reactions between light and heavy hydrogen. Z. Elektrochem., 44: 62-72 (1938); C.A., 32: 2411. EqL, InKi

INGOLD, E. H., INGOLD, C. K., WHITAKER, H., and WHYTLAW-GRAY, R.

- (I-20) Preparation of protium oxide and the determination of the proportion of deuterium in the hydrogen of normal water. Nature, 134: 661 (1934); C.A., 29: 677. AbG, An, Se

INOSHITA, K.

See ITO, M.; TITANI, T.

INOUE, Y.

See TERAQ, A.

IRISH, O. J.

See VIGNEAUD, V. du

ISHAQ, M.

- (I-21) The $\lambda 2708$ and $\lambda 2756$ bands of OD. Proc. Roy. Soc. London, A159: 110-122 (1937); C.A., 31: 7333. SpEl

ISHAQ, M. (Continued)

- (I-22) The (0,0) band of OD. Proc. Natl. Inst. Sci. India, 3: 389-409 (1937); C.A., 32: 4876. SpEl
- (I-23) Extension of the (0,0) band of OD. Proc. Natl. Inst. Sci. India, 5: 309-311 (1939); C.A., 34: 4336. SpEl
- (I-24) The λ 3105, λ 3338 and λ 3375 bands of OD. Current Sci., 9: 275-276 (1940); C.A., 34: 7740. SpEl
- (I-25) The λ 3105 band of OD. Proc. Phys. Soc. London, 53: 355-361 (1941); C.A., 35: 7279. SpEl
- (I-26) The λ 3338 band of OD. Indian J. Phys., 18: 52-56 (1944); C.A., 39: 1103. SpEl

See also PEARSE, R. W. B.

ISHAQ, M., and PEARSE, R. W. B.

- (I-27) Spin coupling in the $^3\Sigma$ states of PH and PD. Proc. Roy. Soc. London, A156: 221-232 (1936); C.A., 30: 7452. SpEl
- (I-28) The λ 3400 bands of PH and PD. Proc. Roy. Soc. London, A173: 265-277 (1939); C.A., 34: 4987. SpEl

ISHAQUE, M.

See ISHAQ, M.

ISHIKAWA, F., and ANDO, S.

- (I-29) Equilibrium in the reduction of stannic oxide by hydrogen and deuterium. Sci. Papers Inst. Phys. Chem. Research Tokyo, 34: 873-887 (1938); C.A., 32: 8246. EqG, EqH

ISHIKAWA, F., and KANAMORI, I.

- (I-30) Adsorption velocities of light- and heavy-water vapors by magnesia. Bull. Inst. Phys. Chem. Research Tokyo, 19: 1213-1219 (1940); C.A., 35: 16. AdG

ISHIKAWA, F., and YOSHIMURA, K.

- (I-31) The velocity of reduction of silver chloride by hydrogen and deuterium. Bull. Inst. Phys. Chem. Research Tokyo, 20: 201-208 (1941); C.A., 35: 3511. KiH

ISIKAWA (ISHIKAWA), H.

See ISHIKAWA, F.

ISKENDERIAN, H. P.

- (I-32) Rankine magnetic balance and the magnetic susceptibility of H_2O , HDO and D_2O . Phys. Rev., 51: 1092-1096 (1937); C.A., 31: 6069. ElMg

ITO, M.

See also TITANI, T.

ITO, M., INOSHITA, K., and TITANI, T.

- (I-33) The action of dilute heavy water on tuberculosis bacilli.
Bull. Chem. Soc. Japan, 10: 260 (1935); C.A., 29: 7361.
BiB

ITOH, M.

See ITO, M.

ITTERBEEK, A. van

- (I-34) Measurements on the surface tension of liquid deuterium.
Physica, 7: 325-328 (1940); C.A., 34: 4955. MeSt
(I-35) Viscosity of light and heavy methane between 322°K and
90°K. Physica, 7: 831-837 (1940); C.A., 35: 7253. MeV

See also DINGENEN, W. van

ITTERBEEK, A. van, and BORGHS, J.

- (I-36) The van der Waals adsorption of gases (H_2 , D_2 , CH_4 , N_2 and
Ne) on nickel flakes. Z. physik. Chem., B50: 128-142
(1942); C.A., 37: 2242. AdG

ITTERBEEK, A. van, BRUYN, P. de, and MARIEENS, P.

- (I-37) Measurements of the absorption of sound in carbon dioxide,
in carbon dioxide containing small quantities of hydrogen,
deuterium, water and deuterium oxide and also in mixtures
of carbon dioxide and oxygen; collision efficiencies. Phys-
ica, 6: 511-518 (1939); C.A., 33: 6671. MeAc

ITTERBEEK, A. van, and CLAES, A.

- (I-38) Viscosity of light hydrogen gas and deuterium between 293°K
and 14°K. Nature, 142: 793-794 (1938); C.A., 33: 1561.
MeV
(I-39) The viscosity of hydrogen and deuterium gas between 293°K
and 14°K. Physica, 5: 938-944 (1938); C.A., 33: 2383.
MeV

ITTERBEEK, A. van, and MARIEENS, P.

- (I-40) Measurements of the absorption of sound in oxygen and in
carbon dioxide containing small quantities of water, deute-
rium oxide and neon—relaxation times for the vibrational
energy. Physica, 7: 125-130 (1940); C.A., 34: 2224. MeAc

ITTERBEEK, A. van, and MARIEENS, P. (Continued)

- (I-41) The excitation, by collision, of intramolecular vibrations in carbon dioxide gas under the influence of foreign gases as a function of temperature. *Physica*, 7: 909-920 (1940); C.A., 37: 2973. MeDf
- (I-42) Sound absorption in light gases. *Physica*, 7: 938-944 (1940); C.A., 35: 7251. MeAc

ITTERBEEK, A. van, and PAEMEL, O. van

- (I-43) Velocity of sound in gaseous argon and deuterium at temperatures of liquid oxygen and hydrogen. Calculation and discussion of the second virial coefficient of argon. *Physica*, 5: 845-854 (1938); C.A., 33: 1561. MeAc
- (I-44) Viscosity of liquid deuterium. *Physica*, 7: 208 (1940); C.A., 34: 4630. MeV
- (I-45) Measurements of the viscosity of neon, hydrogen, deuterium and helium as a function of the temperature, between room temperature and liquid hydrogen temperature. *Physica*, 7: 265-273 (1940); C.A., 34: 4627. MeV
- (I-46) Measurements of the viscosity of gases for low pressures at room temperature and at low temperatures. *Physica*, 7: 273-283 (1940); C.A., 34: 4952. MeV
- (I-47) Determination of the viscosity of liquid hydrogen and deuterium. *Physica*, 8: 133-143 (1941); C.A., 35: 7782. MeV
- (I-48) Remarks concerning the viscosity of liquid hydrogen and deuterium in connection with the theory of Ewell-Eyring. *Physica*, 8: 522-524 (1941); C.A., 35: 7782. MeV

ITTERBEEK, A. van, and SPAEPEN, J.

- (I-49) Measurements on the dielectric constants of several non-polar gases (H, D, He, O and air) and CO between 20°K and ordinary temperatures. *Physica*, 10: 173-184 (1943); C.A., 38: 5442. ElD, ThF

ITTERBEEK, A. van, and THYS, L.

- (I-50) Absorption and velocity of sound in hydrogen, deuterium, helium and neon gases. *Physica*, 5: 889-897 (1938); C.A., 33: 5716. MeAc

ITTERBEEK, A. van, and VANDONINCK, W.

- (I-51) Measurement of the velocity of sound in CO and D as a function of pressure at the temperatures of liquid O and liquid H. Second virial coefficient of D. *Physica*, 10: 481-492 (1934); C.A., 38: 5442. MeAc, ThF

ITTERBEEK, A. van, and VEREYCKEN, W.

- (I-52) The adsorption of vapors of water and of deuterium oxide on glass. Mededeel. Koninkl. Vlaam. Acad. Wetenschap., Belg., Klasse Wetenschap., No. 9: 3-15 (1940); Chem. Zentr., II: 143 (1942); C.A., 37: 3989. AdG
- (I-53) Measurement of van der Waals adsorption of gases (N_2 , A, CO , CH_4 , H_2O , D_2O , etc.) on glass plates. Z. physik. Chem., B48: 131-147 (1941); C.A., 35: 3873. AdG

ITTERBEEK, A. van, and VERMAELEN, R.

- (I-54) Measurements of absorption and velocity of propagation of sound in light and heavy hydrogen between 300 and 60°K. Physica, 9: 345-355 (1942); C.A., 37: 4282. MeAc, ThF

IVES, D. J. G.

- (I-55) Isotopic exchange reactions of organic compounds. II. A survey of the monocarboxylic acid series. J. Chem. Soc., 1938: 81-91; C.A., 32: 2084. AnDn, Eq
- (I-56) Isotopic exchange reactions of organic compounds. III. Kinetics of the isomerization and isotope exchange of vinyl-acetic acid. J. Chem. Soc., 1938: 91-97; C.A., 32: 2085. EqL, InKi, KiL

IVES, D. J. G., and KERLOGUE, R. H.

- (I-57) Isotopic exchange reactions of organic compounds. V. The kinetics of the isomerization and the deuterium exchange reaction of 2-pentenoic acid. J. Chem. Soc., 1940: 1362-1370; C.A., 35: 731. EqL, KiL

IVES, D. J. G., and RYDON, H. N.

- (I-58) Mechanism of three-carbon tautomerism. Nature, 136: 476-477 (1935); C.A., 30: 432. EqL, InKi
- (I-59) Isotopic exchange reactions of organic compounds. I. The intermolecular nature of three-carbon tautomerism. J. Chem. Soc., 1935: 1735-1742; C.A., 30: 1739. EqL, InKi, MeD

IVES, D. J. G., and WILKS, G. C.

- (I-60) Isotopic exchange reactions of organic compounds. IV. The mechanism of racemization of phenyl-*p*-tolylacetic acid. J. Chem. Soc., 1938: 1455-1458; C.A., 33: 169. ElRo, InKi, KiL, Sy

JAACKS, H.

See EUCKEN, A.

JACOBS, L.

- (J-1) The latent heat of fusion of equilibrium mixtures of light and heavy water. *Trans. Faraday Soc.*, 31: 813-821 (1935); *C.A.*, 29: 5007. ThPh

JACOBSEN, C. P.

See HEVESY, G. von

JACOBSEN, O.

See LINDERSTROEM-LANG, K.

JACOBSON, K. P.

See also PEREIRA-FORJAZ, A. de

JACOBSON, K. P., and SOARES, M.

- (J-2) Action of deuterium oxide on malic dehydrogenase. *Compt. rend. soc. biol.*, 126: 592-595 (1937); *C.A.*, 32: 1723. BiC, KiB

JACOBSON, K. P., and TAPADINHAS, J.

- (J-3) Enzyme kinetics in heavy water. *Enzymologia*, 5: 321-325 (1938); *C.A.*, 33: 1354. BiC, KiB

JACOBSON, K. P., TAPADINHAS, J., and SOARES, M.

- (J-4) Effect of deuterium oxide on action of some enzymes. *Arch. Port. Sci. Biol.*, 4: 111-125 (1938); *C.A.*, 37: 4079. BiC, KiB

JAHN, H. A.

See CHILDS, W. H. J.

JAMES, F. W.

See also ANDERSON, J. S.; EMELEUS, H. J.; KING, A.

JAMES, F. W., ANDERSON, J. S., and BRISCOE, H. V. A.

- (J-5) Interchange of hydrogen isotopes in complex cobalt-ammines.
Nature, 139: 109 (1937); C.A., 31: 2117. EqL, KiL

JAMES, H. M., and COOLIDGE, A. S.

- (J-6) Continuous spectra of hydrogen and deuterium. Phys. Rev.,
55: 184-190 (1939); C.A., 33: 2795. SpEl

JAMES, T. H.

- (J-7) Heavy hydrogen as an indicator of the course of chemical
reactions. J. Chem. Education, 13: 458-462 (1936); C.A.,
30: 7996. InKi

JAULMES, P.

- (J-8) Distillation and rectification of dilute solutions of volatile
compounds. I. Theoretical study and application to the
case of heavy water. Chimie & industrie, 33: 1045-1052
(1935); C.A., 29: 4975. SeDs

JENNINGS, W. H.

See KEIL, H. L.

JENSEN, K. A.

See BILLMAN, E.

JEPPESEN, C. R.

- (J-9) Bands in the extreme ultraviolet emission spectrum of the
 H^1H^2 molecule. Phys. Rev., 45: 480-484 (1934); C.A., 28:
6632. SpEl
- (J-10) The emission spectrum of D_2 in the extreme ultraviolet.
Phys. Rev., 49: 797-803 (1936); C.A., 30: 6642. SpEl

JEPPESEN, M. A.

- (J-11) The $^1\Sigma^* - ^1\Sigma$ band system of copper deuteride. Phys. Rev.,
50: 445-449 (1936); C.A., 30: 8021. SpEl

JEUNEHOMME, W.

See GOLDFINGER, P.

JOFFE, J.

- (J-12) Isotopes as a tool in chemical research. A review. Newark
Eng. Notes, 3, No. 1: 10-11 (1939); C.A., 34: 1524. InKi

JOHANSEN, G.

See LINDERSTROEM-LANG, K.

JOHNSON, C. H., and POYNTON, N. H.

- (J-13) Absorption spectra, optical activity and isotopic exchange.
Nature, 139: 842-843 (1937); C.A., 31: 5681. ElRo, SpEl

JOHNSON, M. H., Jr.

- (J-14) The reaction of deuterium on deuterium. Phys. Rev., 51:
779 (1937); C.A., 31: 4886. NuR

JOHNSON, O.

See REYERSON, L. H.

JOHNSTON, E. F.

See HOB DEN, F. W.

JOHNSTON, H.

See MURPHY, G. M.

JOHNSTON, H. L.

- (J-15) Large electronic isotope effects in molecular spectra.
Phys. Rev., 45: 79-81 (1934); C.A., 28: 2996. SpEl
- (J-16) The preparation of deuterium-free water. Deuterium content
of ordinary water and the atomic weight of hydrogen.
Electrolytic separation of oxygen isotopes. J. Am. Chem.
Soc., 57: 484-486 (1935); C.A., 29: 2841. AbG, SeEl
- (J-17) Errata: Preparation of deuterium-free water. Deuterium
content of ordinary water, etc. J. Am. Chem. Soc., 57:
2737 (1935). AbG, SeEl
- (J-18) Deuterium as a research tool in the physical and biological
sciences. An address. Ohio J. Sci., 35: 362-387 (1935);
C.A., 30: 1273. Ge
- (J-19) The density of pure deuterium oxide. J. Am. Chem. Soc.,
61: 878-880 (1939); C.A., 33: 9073. MeD

See also DAVIS, C. O.; ROSSINI, F. D.; SNOW, R. D.; HALL,
W. H.

JOHNSTON, H. L., and DAVIS, C. O.

- (J-20) Chemical separation of the isotopes of hydrogen by the addi-
tion of metals and compounds of metals to water, acids

JOHNSTON, H. L., and DAVIS, C. O. (Continued)

and bases. I. Relative efficiencies of specific reactions. The effects of certain factors other than temperature. J. Am. Chem. Soc., 64: 2613-2620 (1942); C.A., 37: 31. EqH, KiH, SeCh

JOHNSTON, H. L., and DAWSON, D. H.

(J-21) Hydrogen isotope effect in the OH bands. Naturwissenschaften, 21: 495-496 (1933); C.A., 27: 5641. SpEl

(J-22) Spectrum of $O^{16}H^2$. Phys. Rev., 44: 1031 (1933); C.A., 28: 1271. SpEl

JOHNSTON, H. L., and HALL, W. H.

(J-23) Inexpensive equipment for the preparation and concentration of pure D_2O or of deuterium-rich water. Description of construction and operation of the former Ohio State University heavy-water plant. Ohio J. Sci., 41: 357-365 (1941); C.A., 36: 2784. SeEl

JOHNSTON, H. L., and LONG, E. A.

(J-24) Heat-capacity curves of the simpler gases. VI. Rotational heat-capacity curves of molecular deuterium and of deuterium hydride. The equilibrium between the ortho and para forms of deuterium. Free energy, total energy, entropy, heat capacity and dissociation of H^2H^2 and of H^1H^2 to 3000°K. J. Chem. Phys., 2: 389-395 (1934); C.A., 28: 5323. EqG, ThF

JOHNSTON, M.

See DENNISON, D. M.

JONES, D. C.

See FOSTER, J. S.

JONES, F. L.

(J-25) Sparking potential of deuterium. Nature, 143: 854 (1939); C.A., 33: 5754. ElGd

(J-26) Influence of the cathode on the sparking potential of heavy hydrogen. Phil. Mag., 28: 328-337 (1939); C.A., 34: 318. ElGd

JONES, G., and FORNWALT, H. J.

(J-27) The viscosity of deuterium oxide and its mixtures with water at 25°. J. Chem. Phys., 4: 30-33 (1936); C.A., 30: 1624. MeV

JONES, G., and RAY, W. A.

- (J-28) The surface tension of deuterium oxide and of its mixtures with water. *J. Chem. Phys.*, 5: 505-508 (1937); C.A., 31: 5640. MeD, MeSt

JONES, R. C.

- (J-29) The theory of the thermal diffusion coefficient for isotopes. *Phys. Rev.*, 58: 111-122 (1940); C.A., 34: 6522. MeDf, SeDf
- (J-30) The effect of van der Waals forces on the thermal diffusion coefficient of gaseous isotopic mixtures. *Phys. Rev.*, 59: 688-689 (1941); C.A., 36: 3422. MeDf
- (J-31) The theory of the thermal diffusion coefficient for isotopes. II. *Phys. Rev.*, 59: 1019-1033 (1941); C.A., 35: 5389. MeDf, SeDf

See also FURRY, W. H.

JONES, T., and SHERMAN, A.

- (J-32) Calculation of equilibrium constants and activation energies for some reactions involving various isotopic species of hydrogen, water and hydrogen sulfide. *J. Chem. Phys.*, 5: 375-381 (1937); C.A., 31: 4877. EqG, EqH, InKi, KiG, KiH

JONES, T. O.

See HALL, N. F.

JONGE, J. de

- (J-33) Deuterium in organic chemistry. A review. *Chem. Weekblad*, 37: 383-386, 395-400, 406-410 (1940); C.A., 36: 4473. Ge

JONNARD, R.

- (J-34) Analysis of biological compounds containing deuterium by interferometric refractometry. *Bull. soc. chim. biol.*, 21: 1185-1193 (1939); C.A., 34: 2006. AnRf

JOOS, G., and BOEHN, H.

- (J-35) The influence of heavy water of crystallization on the line-like absorption spectra of chrome alums. *Physik. Z.*, 36: 826-827 (1935); C.A., 30: 1656. SpEl

JORDAN, E. B.

See BAINBRIDGE, K. T.

JORGENSEN, T., Jr.

See CRAWFORD, F. H.

JORIS, G.

See also JUNGERS, J. C.

JORIS, G., TAYLOR, H. S., and JUNGERS, J. C.

- (J-36) The catalytic interaction of hydrogen and deuterium with ethylene and deuterioethylenes on copper. *J. Am. Chem. Soc.*, 60: 1982-1986 (1938); *C.A.*, 32: 8897. KiH, Sy

JOST, W.

See also HARRIS, L.

JOST, W., and WIDMANN, A.

- (J-37) The diffusion of hydrogen and deuterium in palladium. I. *Z. physik. Chem.*, B29: 247-255 (1935); *C.A.*, 29: 7163. KiH, MeDf
- (J-38) Diffusion of hydrogen and deuterium in palladium. II. *Z. physik. Chem.*, B45: 285-296 (1940); *C.A.*, 34: 4632. MeDf

JOUAN, R.

- (J-39) Comparative diffusion speeds of hydrogen and deuterium through hot platinum. *J. phys. radium*, 7: 101-106 (1936); *C.A.*, 30: 4737. MeDf

JUENGER, H. O.

See BEUTLER, H.

JUNGERS, J. C.

- (J-40) The radiochemical decomposition of deuterioammonia. *J. Phys. Chem.*, 40: 155-158 (1936); *C.A.*, 30: 2109. KiR

See also DELFOSSE, J.; FOERSTER, T.; HEMPTINNE, M.; JORIS, G.; LIND, S. C.; TAYLOR, H. S.

JUNGERS, J. C., and BONHOEFFER, K. F.

- (J-41) The velocity of exchange of hydroxyl hydrogen in aqueous solutions. *Z. physik. Chem.*, A177: 460-464 (1936); *C.A.*, 31: 2501. KiL

JUNGERS, J. C., and JORIS, G.

- (J-42) The action of ethyl radicals upon the isotopes of ethylene and of acetylene. *Bull. soc. chim. Belges*, 50: 61-66 (1941); *C.A.*, 36: 394. InKi, KiG

JUNGERS, J.C., and TAYLOR, H.S.

- (J-43) Mercury-photosensitized decomposition of the deuterioammonias. J. Chem. Phys., 2: 373-380 (1934); C.A., 28: 5337. KiP, MeD, SpEl, Sy, ThPh
- (J-44) The decomposition of deuterioammonia on tungsten filaments. J. Am. Chem. Soc., 57: 679-681 (1935); C.A., 29: 3582. KiH
- (J-45) The mercury-photosensitized polymerization of acetylene and acetylene-d₂. J. Chem. Phys., 3: 338-340 (1935); C.A., 29: 5023. KiP, Sy
- (J-46) The mercury-photosensitized hydrogenation of ethylene, ethylene-d₄ and partially deuterized ethylenes. J. Chem. Phys., 6: 325-330 (1938); C.A., 32: 6156. KiP

JUNGERS, J.C., and WIRTZ, K.

- (J-47) The exchange of hydrogen between ethyl alcohol and Ca(OD)₂. Bull. soc. chim. Belges, 45: 679-683 (1936); C.A., 31: 1683. EqL, InKi

JUSTI, E., and LUEDER, H.

- (J-48) Specific heat, entropy and dissociation of gases and vapors. Forsch. Gebiete Ingenieurw., B6: 209-216 (1935); C.A., 30: 4746. EqG, ThF

KACHENKOV, S. M.

- (K-1) Absorption spectra of praseodymium and neodymium in heavy water. *Compt. rend. acad. sci. U.R.S.S.*, 18: 557-558 (1938); *C.A.*, 32: 6946. EIC1

See also FIALKOVSKAYA, O. V.

KAERTKEMEYER, L.

See MUND, W.

KAILAN, A., and EBENEDER, F.

- (K-2) The effect of heavy water on the velocity of saponification of esters and on the equilibrium constant. *Z. physik. Chem.*, A180: 157-160 (1937); *C.A.*, 32: 28. EqL, KiL
- (K-3) Effect of heavy water on the velocity of saponification of esters and on the equilibrium constant. II. *Z. physik. Chem.*, A182: 397-404 (1938); *C.A.*, 33: 456. EqL, KiL, MeD

KAILAN, A., and HORNY, H.

- (K-4) The effect of heavy water on the esterification velocity of benzoic acid in ethyl alcoholic hydrochloric acid. *Ber.*, 69A: 437-440 (1936); *C.A.*, 30: 3303. KiL

KALANDYK, S.

- (K-5) Thermionic emission of platinum in hydrogen and in oxygen. *Acta Phys. Polon.*, 7: 68-80 (1938); *C.A.*, 33: 1585. AdG

KALCKAR, F., and TELLER, E.

- (K-6) Ratio of the magnetic moments of proton and dipton (deuton). *Nature*, 134: 180 (1934); *C.A.*, 28: 6356. NuMg
- (K-7) Theory of the catalysis of the ortho-para transformation by paramagnetic gases. *Proc. Roy. Soc. London*, A150: 520-533 (1935); *C.A.*, 29: 6826. NuR, NuS

KALLMANN, H., and LASAREFF, W.

- (K-8) Mass spectrographic isotope research on hydrogen and heli-

KALLMANN, H., and LASAREFF, W. (Continued)

um. *Naturwissenschaften*, 20: 206 (1932); C.A., 26: 4243.
AnMs

(K-9) The hydrogen isotope of mass 2. *Naturwissenschaften*, 20:
472 (1932); C.A., 26: 4749. Ge

KAMIENSKI, B.

(K-10) Theoretical and experimental studies on the method of ob-
taining heavy water. *Roczniki Chem.*, 14: 401-405 (1934);
C.A., 29: 2442. SeAd, SeEl

KANAMORI, I.

See ISHIKAWA, F.

KANEKO, O.

See SIBATA, Y.

KANNULUIK, W.G.

(K-11) Thermal conductivity of deuterium. *Nature*, 137: 741 (1936);
C.A., 30: 4746. ThD

(K-12) Thermal conductivity of gases by a relative method with an
application to deuterium. *Proc. Roy. Soc. London*, A175:
36-48 (1940); C.A., 34: 3959. ThD

KAPTEIN, A.J.G.

(K-13) Isotopes. A review. *Chem. Weekblad*, 30: 695-701 (1933);
C.A., 28: 3978. Ge

KAPUSTINSKAYA, N. F.

See SHAMOVSKII, L. M.

KAPUSTINSKII, A. F.

(K-14) The equilibrium of the light and heavy isotopes of hydrogen
with crystalline cuprous chloride. *J. Am. Chem. Soc.*,
58: 460-463 (1936); C.A., 30: 3301. EqH

KAPUSTINSKII, A. F., SHAMOVSKII, L. M., and BAYUSHKINA, K. S.

(K-15) Thermochemistry of isotopes. Absorption spectra and the
heats of formation of the hydrides and deuterides of lith-
ium. *J. Phys. Chem. U.S.S.R.*, 10: 620-626 (1937); C.A.,
32: 5699. ElCl, ThF

KARLE, J., and BROCKWAY, L. O.

(K-16) An electron-diffraction investigation of the monomers and
dimers of formic, acetic and trifluoroacetic acids and the

KARLE, J., and BROCKWAY, L. O. (Continued)

dimer of deuterium acetate. J. Am. Chem. Soc., 66: 574-584 (1944); C.A., 38: 2532. Ed

KASATKINA, I. A., and FLORENSKII, K. P.

(K-17) Isotopic composition of the water of some seas and salt lakes. Compt. rend. acad. sci. U.R.S.S., 30, No. 9: 822-823 (1941); C.A., 37: 310. AbG

KASSATKINA, I. A.

See KASATKINA, I. A.

KASSEL, L. S., and STORCH, H. H.

(K-18) Chemical kinetics of the reaction of oxygen with hydrogen and with deuterium. J. Am. Chem. Soc., 57: 672-678 (1935); C.A., 29: 3582. KiG

KATCHENKOV, S. M.

See KACHENKOV, S. M.

KAUZMANN, W.

See GORIN, E.

KEESOM, W. H., and van DIJK, H.

(K-19) The separation of isotopes by rectification, and rectification as a method of purifying gases. 7th Congr. intern. Froid, 1st Comm. intern., Rapports et Communi., June 1936: 103-111; C.A., 30: 7928. SeDs

KEESOM, W. H., van DIJK, H., and HAANTJES, J.

(K-20) Increase of concentration of H^1H^2 by fractional evaporation and rectification. Proc. Koninkl. Nederland. Akad. Wetenschap., 36: 248-252 (1933); C.A., 27: 5002. SeDs

KEIL, A.

See STEUBING, A.

KEIL, H. L., RALSTON, A. W., KELLEY, M. T., CATLIN, W. E., JENNINGS, W. H., STRALEY, J., and GILMAN, H.

(K-21) Heavy water obtained by the combustion of dried biological specimens. Proc. Iowa Acad. Sci., 42: 122 (1935); C.A., 30: 8252. AbO

KELLER, F.

See GUENTHERSCHULZE, A.

KELLEY, M. T.

See KEIL, H. L.

KELLNER, L.

- (K-22) The near-infrared absorption spectrum of heavy water. Proc. Roy. Soc. London, A159: 410-415 (1937); C.A., 31: 7755. SpVi

KELLOGG, J. M. B.

See also RABI, I. I.

KELLOGG, J. M. B., RABI, I. I., RAMSEY, N. F., Jr., and ZACHARIAS, J. R.

- (K-23) An electrical quadrupole moment of the deuteron. Phys. Rev., 55: 318-319 (1939); C.A., 33: 2802. NuMg
- (K-24) The radiofrequency spectrum of the HD molecule in magnetic fields. Phys. Rev., 56: 213 (1939); C.A., 35: 4684. EID, NuMg
- (K-25) Magnetic moments of the proton and the deuteron-radiofrequency spectrum of H_2 in various magnetic fields. Phys. Rev., 56: 728-743 (1939); C.A., 34: 321. EID, NuMg
- (K-26) Electric quadrupole moment of the deuteron-radiofrequency spectra of HD and D_2 molecules in a magnetic field. Phys. Rev., 57: 677-695 (1940); C.A., 34: 4336. EID, NuMg

KELLOGG, J. M. B., RABI, I. I., and ZACHARIAS, J. R.

- (K-27) The sign of the magnetic moment of the deuteron. An abstract. Phys. Rev., 49: 641 (1936); C.A., 31: 5677. NuMg
- (K-28) Sign of the magnetic moment of the proton and of the deuteron. Nature, 137: 658 (1936); C.A., 30: 4395. NuMg
- (K-29) The magnetic moment of the deuteron. An abstract. Phys. Rev., 49: 867 (1936); C.A., 31: 5677. NuMg
- (K-30) The gyromagnetic properties of the hydrogens. Phys. Rev., 50: 472-481 (1936); C.A., 30: 8020. NuMg

KEMP, I.

See HUGHES, A. H.

KEMP, J. D.

See LONG, E. A.

KENNEDY, J. W.

See SEABORG, G. T.

KENNER, J., POLANYI, M., and SZEGO, P.

(K-31) Aluminum chloride as a catalyst of hydrogen interchange.
Nature, 135: 267-268 (1935); C.A., 29: 2443. EqH, KiH

KENT, N. A., and LACOUNT, R. G.

(K-32) Interferometer wave lengths of certain lines in the secondary spectrum of D₂ and HD. Phys. Rev., 51: 241-242 (1937); C.A., 31: 4592. SpEl

KENYON, H. F.

See BOWDEN, F. P.

KENYON, J.

See COPPOCK, J. B. M.

KERLOGUE, R. H.

See IVES, D. J. G.

KESTON, A. S.

(K-33) Isotopes and their applications in biochemistry. Frontiers in Chemistry, 3: 1-18 (1945); C.A., 39: 4281. Ge

See also FOSTER, G. L.; RITTENBERG, D.; SCHOENHEIMER, R.

KESTON, A. S., RITTENBERG, D., and SCHOENHEIMER, R.

(K-34) Determination of deuterium in organic compounds. J. Biol. Chem., 122: 227-237 (1937); C.A., 32: 1612. AnDn, AnRf

KETELAAR, J. A. A.

(K-35) The infrared absorption and reflection spectra of KHF₂ and KDF₂. J. Chem. Phys., 9: 775-776 (1941); C.A., 35: 7831. SpVi

(K-36) Investigations in the infrared. I. The absorption and reflection spectra of KHF₂, KDF₂ and RbHF₂ in relation to the constitution of the bifluoride ion. Rec. trav. chim., 60: 523-555 (1941); C.A., 37: 312. SpVi

KHARASCH, M. S.

See also BROWN, W. G.

KHARASCH, M. S., BROWN, W. G., and McNAB, J.

- (K-37) Exchange reactions in deuterio alcohol. *J. Org. Chem.*, 2: 36-48 (1937); *C.A.*, 31: 5755. EqL, Sy

KILDE, G.

- (K-38) Heavy water. A review. *Dansk. Tids. Farm.*, 13: 69-92 (1939); *C.A.*, 33: 5250. Ge

KING, A.

See also ANDERSON, J. S.; EMELEUS, H. J.

KING, A., JAMES, F. W., LAWSON, C. G., and BRISCOE, H. V. A.

- (K-39) Selective adsorption of heavy water. *J. Chem. Soc.*, 1935: 1545-1549; *C.A.*, 30: 2451. AdG

KING, A., and LAWSON, C. G.

- (K-40) The absorption isotherm of heavy water on charcoal. *Trans. Faraday Soc.*, 32: 478-481 (1936); *C.A.*, 30: 2822. AdG

KING, D. W., and LUDLAM, E. B.

- (K-41) Chain theory of the oxidation of phosphorous vapor. I. Comparison of the effects of hydrogen, deuterium and helium on the lower explosion limit of phosphorous-oxygen mixtures. *J. Chem. Soc.*, 1938: 1500-1503; *C.A.*, 33: 2021. KiG

KING, G. W.

- (K-42) Anharmonicity constants of the potential function of the water molecule. *J. Chem. Phys.*, 5: 413-415 (1937); *C.A.*, 31: 4861. SpVi

KING, T., and OUELLET, C.

- (K-43) Sorption of deuterium oxide by cellulose. *Can. J. Research*, 14B: 444-449 (1936); *C.A.*, 31: 2413. AdL

KINGERLEY, R. W., and La MER, V. K.

- (K-44) Exchange and transfer equilibria of acids, bases and salts in deuterium-protium oxide mixtures. The ion product constant of deuterium oxide. *J. Am. Chem. Soc.*, 63: 3256-3263 (1941); *C.A.*, 36: 954. EqI, EqL, ThF

KINSEY, E. L.

See ELLIS, J. W.

KINSEY, V. E., GRANT, M., and COGAN, D. G.

- (K-45) Water movement and the eye. Arch. Ophthalmol. Chicago, 27: 242-252 (1942); C.A., 36: 4564. InBi

KIRSHENBAUM, I., and UREY, H. C.

- (K-46) The differences in the vapor pressures, heats of vaporization and triple points of nitrogen isotopes and of ammonia and trideuterioammonia. J. Chem. Phys., 10: 706-717 (1942); C.A., 37: 821. Sy, ThPh

KISSIN, G. H.

See HALFORD, J. O.

KISTIAKOWSKY, G. B.

See also CUTHBERTSON, G. R.

KISTIAKOWSKY, G. B., LACHER, J. R., and STITT, F.

- (K-47) The low temperature gaseous heat capacities of C_2H_6 and C_2D_6 . J. Chem. Phys., 7: 289-296 (1939); C.A., 33: 5273. ThF

KISTIAKOWSKY, G. B., and RICE, W. W.

- (K-48) Gaseous heat capacities. I. The method and the heat capacities of C_2H_6 and C_2D_6 . J. Chem. Phys., 7: 281-288 (1939); C.A., 33: 5273. ThF

KISTIAKOWSKY, G. B., and TICHENOR, R. L.

- (K-49) Use of deuterium as a tracer in the Claisen rearrangement. J. Am. Chem. Soc., 64: 2302-2304 (1942); C.A., 37: 354. InKi, Sy

KITAGAWA, H.

- (K-50) Thermal diffusion. III. Measurement of thermal diffusion in a mixture of H_2 and HD. J. Chem. Soc. Japan, 61: 1243-1248 (1940); C.A., 35: 2045. ThD

KITASATO, Y.

See MIZUSIMA, S.

KLAR, R.

- (K-51) Alleged influence of heavy water on mold growth. Nature, 134: 104 (1934); C.A., 28: 6733. BiB

KLAR, R. (Continued)

- (K-52) Exchange of hydrogen atoms in organic compounds with the hydrogen atoms of water. Z. physik. Chem., B26: 335-342 (1934); C.A., 28: 7123. EqL
- (K-53) Hydrogenation of ethylene with heavy hydrogen. Z. physik. Chem., B27: 319-320 (1934); C.A., 29: 1383. KiH
- (K-54) Adsorption of light and heavy hydrogen by nickel. Naturwissenschaften, 22: 822 (1934); C.A., 29: 2810. AdG
- (K-55) The adsorption of light and heavy hydrogen in relation to the hydrogenation of ethylene. II. Z. physik. Chem., A174: 1-14 (1935); C.A., 30: 11. AdG, EqH, KiH
- (K-56) The adsorption of ethane, ethylene, acetylene and hydrogen and the polymerization and hydration of ethylene and acetylene on carbon, carbon contacts and active iron. Z. Elektrochem., 43: 379-389 (1937); C.A., 31: 7308. AdG, KiH

See also BONHOEFFER, K. F.; MOELWYN-HUGHES, E. A.

KLAR, R., and ZICKLER, H.

- (K-57) Plant growth in heavy water. Aus der Natur, 11: 205-207 (1934). BiB

KLEINWAECHTER, H.

See GUENTHERSCHULZE, A.

KLEMENC, A., and BANKOWSKI, O.

- (K-58) Deuterioacetylene. Naturwissenschaften, 22: 465 (1934); C.A., 28: 7243. Sy

KLIT, A.

See also LANGSETH, A.

KLIT, A., and LANGSETH, A.

- (K-59) Raman spectrum of deuteriobenzenes. Nature, 135: 956 (1935); C.A., 29: 5745. SpVi, Sy
- (K-60) The production of deuteriobenzene (benzene-d₆). Z. physik. Chem., A176: 65-80 (1936); C.A., 30: 5091. EqL, MeD, Sy, ThPh
- (K-61) The Raman spectra of deuteriated benzenes and the symmetry of the benzene molecule. J. Chem. Phys., 5: 925-926 (1937); C.A., 32: 48. SpVi

KLUGE, W., and UHLMANN, W.

- (K-62) The influence of light and heavy hydrogen on the selective photoeffect of the alkali metals. *Z. tech. Physik*, 17: 431-436 (1936); *Physik. Z.*, 37: 857-862 (1936); *C.A.*, 31: 939. AdG

KNOWLES, A. E.

See PATENTS, BRITISH, FRENCH, GERMAN, U.S.

KNOWLTON, J. W.

See also ROSSINI, F. D.

KNOWLTON, J. W., and ROSSINI, F. D.

- (K-63) Method and apparatus for the rapid conversion of deuterium oxide into deuterium. *J. Research Natl. Bur. Standards* (research paper No. 1050), 19: 605-612 (1937); *C.A.*, 32: 2007. Sy

KNUTH, E.

See BILMAN, E.

KOELSCH, W.

See CLUSIUS, K.

KOHLRAUSCH, K. W. F.

- (K-64) Raman spectrum and benzene symmetry. *Naturwissenschaften*, 23: 624-625 (1935); *C.A.*, 30: 962. SpVi
- (K-65) The Raman effect. Vibrational spectrum of benzene. *Z. physik. Chem.*, B30: 305-315 (1935); *C.A.*, 30: 2492. SpVi
- (K-66) Raman spectra of benzene and its derivatives. *Physik. Z.*, 37: 58-79 (1936); *C.A.*, 30: 2492. SpVi
- (K-67) The quantum light emission. 2A. The Smekal-Raman effect. *Physik regalmaess. Ber.*, 7: 79-88 (1939); *C.A.*, 33: 4504. SpVi

KOHLSCHUETTER, H. W.

- (K-68) Chemistry of solid surfaces. II. The velocity of adsorption of hydrogen and deuterium by chromic oxide. *Z. physik. Chem.*, A170: 300-308 (1934); *C.A.*, 29: 394. AdG, SeAd

KOHMAN, G. T.

See HOLDEN, A. N.

KOIZUMI, M. (formerly MASAO HARADA)

- (K-69) The exchange reaction of the nuclear hydrogen atoms of phenol. II. The exchange reaction in acid solution. Bull. Chem. Soc. Japan, 14: 353-362 (1939); C.A., 34: 1902. EqL, KiL
- (K-70) Exchange of hydrogen atoms between pyrrole, indole and their methylene derivatives and water. VI. Exchange of hydrogen atom between α -methyl, β -methyl, and α,β -dimethylindole and water. Bull. Chem. Soc. Japan, 14: 453-461 (1939); C.A., 34: 2371. EqL
- (K-71) Exchange of hydrogen atoms between pyrrole, indole and their methylene derivatives and water. VII. Exchange of hydrogen atom between indole, indene and water in alkaline solution. Bull. Chem. Soc. Japan, 14: 491-500 (1939); C.A., 34: 2371. EqL
- (K-72) Exchange reactions of nuclear hydrogen atoms of aniline hydrochloride in aqueous solution. I. The reaction in neutral and acid solution. Bull. Chem. Soc. Japan, 14: 530-539 (1939); C.A., 34: 2342. EqL
- (K-73) Exchange reactions of nuclear hydrogen atoms of aniline hydrochloride in aqueous solution. II. The reaction in alkaline solution. Bull. Chem. Soc. Japan, 15: 8-15 (1940); C.A., 34: 4061. EqL
- (K-74) Exchange reactions of nuclear hydrogen atoms of aniline hydrochloride in aqueous solution. III. Activation energy. Bull. Chem. Soc. Japan, 15: 37-46 (1940); C.A., 34: 4649. EqL, KiL

KOIZUMI, M., KOMAKI, Y., and TITANI, T.

- (K-75) Exchange of hydrogen atoms between pyrrole, indole and their methylene derivatives and water. V. Exchange of hydrogen atoms between N-methylindole and water. Bull. Chem. Soc. Japan, 13: 643-651 (1938); C.A., 33: 2022. EqL, KiL

KOIZUMI, M., and TITANI, T.

- (K-76) The exchange of hydrogen atoms between pyrrole and water. Preliminary communication. Bull. Chem. Soc. Japan, 12: 107-108 (1937); C.A., 32: 28. EqL
- (K-77) Polymerization of styrene in heavy water and heavy alcohol. (Preliminary communication). Bull. Chem. Soc. Japan, 13: 304-305 (1938); C.A., 32: 4413. KiL

KOIZUMI, M., and TITANI, T. (Continued)

- (K-78) Exchange of hydrogen atoms between pyrrole, indole and their methylene derivatives and water. IV. Exchange of hydrogen atoms between indole and water. Bull. Chem. Soc. Japan, 13: 307-318 (1938); C.A., 32: 4863. EqL, KiL
- (K-79) Exchange reaction of hydrogen atoms between nitrophenol and water. I. Exchange reaction and hydrogen binding. Bull. Chem. Soc. Japan, 13: 318-328 (1938); C.A., 32: 4863. EqL, KiL
- (K-80) Exchange reaction of hydrogen atoms between sugar and water. Bull. Chem. Soc. Japan, 13: 427-436 (1938); C.A., 32: 8892. EqL, KiL
- (K-81) Exchange reactions of hydrogen atoms between nitrophenol and water. II. Chemistry of the reaction. Bull. Chem. Soc. Japan, 13: 595-600, 631-643 (1938); C.A., 33: 2022. EqL
- (K-82) The exchange reaction of the nuclear hydrogen atoms of phenol. I. Exchange reaction in alkaline solution. Bull. Chem. Soc. Japan, 13: 681-690 (1938); C.A., 33: 2399. EqL, KiL
- (K-83) Exchange reaction of hydrogen atoms between nitrophenol and water. III. Activation energy. Bull. Chem. Soc. Japan, 14: 40-47 (1939); C.A., 33: 4498. EqL, KiL

KOMAKI, Y.

See KOIZUMI, M.

KOONTZ, P. G.

- (K-84) The spectrum of AgD . Phys. Rev., 48: 138-140 (1935); C.A., 29: 7185. SpEl
- (K-85) Beryllium deuteride spectra. Phys. Rev., 48: 707-713 (1935); C.A., 30: 3323. SpEl

KOPFERMANN, H.

- (K-86) The fine structure of $\text{H}\alpha$. Naturwissenschaften, 22: 218 (1934); C.A., 28: 4978. SpA

KOPP, J.

See REITZ, O.

KOPPER, H.

- (K-87) Critical temperatures of several simple deuterium compounds. Z. physik. Chem., A175: 469-472 (1936); C.A., 30: 5091. ThPh

KORCHAGIN, L. V., and PIONTKOVSKAYA, M. A.

(K-88) The absorption spectrum of heavy acetone in solution in hexane. *Acta. Physicochim. U.R.S.S.*, 10: 881-884 (1939); *C.A.*, 33: 8114. EICl

(K-89) Absorption spectrum of heavy acetone in hexane. *J. Phys. Chem. U.S.S.R.*, 13: 1154-1155 (1939); *C.A.*, 34: 4660. EICl

KORCHAGIN, L. V., and URIZKO, M. I.

(K-90) Exchange reaction between hydrogen and deuterium in heterogeneous systems. *J. Phys. Chem. U.S.S.R.*, 14: 1566-1568 (1940); *C.A.*, 36: 5413. EqH

KORMAN, S.

See also La MER, V. K.

KORMAN, S., and La MER, V. K.

(K-91) Deuterium exchange equilibria in solution and the quinhydrone electrode. *J. Am. Chem. Soc.*, 58: 1396-1403 (1936); *C.A.*, 30: 6625. EcP, EqH, EqI, EqL, ThF, SoH

KORSHING, H.

(K-92) Separation of C_6H_6 and C_6D_6 by thermal diffusion in the liquid. *Naturwissenschaften*, 31: 348-349 (1943); *C.A.*, 38: 1673. SeDf

KOSTER, H.

See SHAPIRO, A.

KOTESWARAM, P.

See RAO, I. R.

KOWALSKI, H.

See CLUSIUS, K.

KOYANO, T.

(K-93) Organic deuterium compounds. I. Interchange equilibrium between benzene and water. *J. Chem. Soc. Japan*, 57: 929-932 (1936); *C.A.*, 31: 667. EqL

(K-94) Organic deuterium compounds. II. Interchange reactions between benzene and water. *J. Chem. Soc. Japan*, 57: 933-935 (1936); *C.A.*, 31: 667. EqL

See also HORIUCHI, J.

KRASNY-ERGEN, W.

- (K-95) Optimal dimensions of a Clusius-Dickel isotope separator.
Phys. Rev., 58: 1078-1085 (1940); C.A., 35: 1312. SeDf

KRAUSS, F.

See GROSS, P.

KRISHNAMURTI, K.

- (K-96) The effect of magnetic field on streams of charged particles.
Current Sci. India, 2: 387-388 (1934); C.A., 28: 4657.
SeMs

KROEGER, F. A.

See SMITS, A.

KROGH, A.

- (K-97) Use of deuterium in biological work. Enzymologia, 5: 185-189 (1938); C.A., 33: 660. InBi

See also FENGER-ERIKSEN, K.; HEVESY, G. von

KROGH, A., and USSING, H. H.

- (K-98) The exchange of hydrogen between free water and the organic substance in the living organism. Acta Physiol. Scand., 75: 90-104 (1936); C.A., 30: 8267. InBi
- (K-99) A note on the permeability of trout eggs to D_2O and H_2O . J. Exptl. Biol., 14: 35-37 (1937); C.A., 31: 4684. BiZ
- (K-100) Deuterium built into proteins and their amino acids in vivo and in vitro. Compt. rend. trav. lab. Carlsberg, Sér. chim., 22: 282-287 (1938); C.A., 32: 6265. InBi

KRONIG, R. de L.

- (K-101) Note on the determination of isotopic masses from band spectra. Physica, 1: 617-622 (1934); C.A., 28: 6063. SpEl

KROUGH, A.

See KROGH, A.

KRUIS, A.

- (K-102) Transformations of H_2Se - $HDSe$ - D_2Se solid solutions. Z. physik. Chem., B48: 321-335 (1941); C.A., 36: 1232. ThPh

See also CLUSIUS, K.; GRAFE, D.

KRUIS, A., and CLUSIUS, K.

(K-103) Visual evidence of transformation in condensed H_2S and D_2S .
Physik. Z., 38: 510-514 (1937); C.A., 31: 6526. ThPh

(K-104) The heat capacities and transformations of the condensed
hydrides and deuterides of sulfur and selenium. Z.
physik. Chem., B38: 156-176 (1937); C.A., 32: 1172. Sy,
ThPh

KRUIS, A., POPP, L., and CLUSIUS, K.

(K-105) Transitions in solid hydrides and deuterides. Z. Elektro-
chem., 43: 664-666 (1937); C.A., 31: 7716. MeD, ThPh

KUECHLER, L.

See SCHWARZ, K.

KUPER, J. B. H.

See HARNWELL, G. P.

KURANO, K.

See TITANI, T.

KURODA, Z.

See OKAZAKI, N.

KUSAKA, S.

See CHRISTY, R. F.

KUSCH, P., and MILLMAN, S.

(K-106) The masses and magnetic moments of the proton, neutron,
and deuteron. Phys. Rev., 56: 214 (1939). NuM, NuMg

KUZIRAI, M.

See SIBATA, Z.

KWAN, T.

See HORIUCHI, J.; OKAMOTO, G.

LABY, T. H.

See CHRISTIANSEN, W. N.

LACHER, J. R.

See KISTIAKOWSKY, G. B.

LACHS, H., and MINKOW, I.

(L-1) Surface tension of heavy water. *Nature*, 136: 186-187 (1935);
C.A., 29: 7142. MeSt

(L-2) Surface tension of heavy water. *Roczniki Chem.*, 17: 363-
366 (1937); C.A., 31: 8287. MeSt

LACOUNT, R. G.

See KENT, N. A.

LADENBURG, R.

(L-3) The mass of the neutron and the stability of heavy hydrogen.
Phys. Rev., 45: 224-225 (1934); C.A., 28: 2608. NuR

(L-4) Errata. The mass of the neutron, etc. *Phys. Rev.*, 45: 495
(1934); C.A., 28: 3297. NuR

LAKE, D. B.

See FINK, C. G.

La MER, V. K.

See also BAKER, W. N.; BRESCIA, F.; CHITTUM, J. P.;
GREENSPAN, J.; HAMILL, W. H.; KINGERLEY, R. W.;
KORMAN, S.; LIOTTA, S.; MARON, S. H.; NOONAN, E.;
RULE, C. K.

La MER, V. K., and ARMBRUSTER, M. H.

(L-5) Micro quinhydrone-silver chloride cell for precision e.m.f.
studies on heavy water. *J. Am. Chem. Soc.*, 57: 1510-1511
(1935); C.A., 29: 6845. EcP, EqL

La MER, V. K., and BAKER, W. N.

(L-6) The freezing point of mixtures of H_2O and D_2O . The latent

La MER, V. K., and BAKER, W. N. (Continued)

heat of fusion of D_2O . J. Am. Chem. Soc., 56: 2641-2643 (1934); C.A., 29: 990. ThPh

La MER, V.K., and BRESCIA, F.

(L-7) Electrostatic effects on ionization constants. J. Am. Chem. Soc., 62: 617-620 (1940); C.A., 34: 2683. EqI, ThF

La MER, V.K., and CHITTUM, J. P.

(L-8) The conductance of salts (potassium acetate) and the dissociation constant of acetic acid in deuterium oxide. J. Am. Chem. Soc., 58: 1642-1644 (1936); C.A., 30: 7972. EcC, EqI

La MER, V.K., and EICHELBERGER, W.C., and UREY, H. C.

(L-9) Freezing point of mixtures of H_2O and H_2^2O . J. Am. Chem. Soc., 56: 248-249 (1934); C.A., 28: 1587. ThPh

La MER, V.K., and GREENSPAN, J.

(L-10) Kinetics of the solvent decomposition of nitramide in H_2O - D_2O mixtures. Trans. Faraday Soc., 33: 1266-1272 (1937); C.A., 31: 8335. KiL

La MER, V.K., and HOCHBERG, S.

(L-11) Hydrogen and deuterium exchange between nitramide and water. J. Am. Chem. Soc., 61: 2552-2553 (1939); C.A., 33: 9099. EqL

La MER, V.K., and KORMAN, S.

(L-12) E.m.f. of the 'quinhydrone electrode in heavy water. The acidic dissociation of deuterioquinone. J. Am. Chem. Soc., 57: 1511 (1935); C.A., 29: 6845. EcP, EqI, EqL

(L-13) The determination of acidity in heavy-water mixtures. Science, 83: 624-626 (1936); C.A., 30: 5486. EqI

La MER, V.K., and NACHOD, F. C.

(L-14) The temperature coefficient of the conductance of potassium chloride in H_2O - D_2O mixtures. J. Chem. Phys., 9: 265-268, 379 (1941); C.A., 35: 3146. EcC

La MER, V.K., and NOONAN, E.

(L-15) Thermodynamics of strong electrolytes in protium-deuterium oxide mixtures. II. Potassium chloride. J. Am. Chem. Soc., 61: 1487-1491 (1939); C.A., 33: 6689. ThF

LANDERMAN, A.

See BRESLER, S. E.

LANDSBERG, G. S.

- (L-16) Isotope of hydrogen of mass 2. A review. Uspekhi Fiz. Nauk., 12: 343-350 (1932); C.A., 28: 406. Ge

LANDSBERG, G. S., MALYSHEV, V. I., and SOLOV'EV, V. E.

- (L-17) Diffusion by heavy-water solutions. Compt. rend. acad. sci. U.R.S.S., 24: 872-873 (1939); C.A., 34: 3586. ThD

LANGE, E.

- (L-18) Thermal properties and solvent power of heavy water. Z. Elektrochem., 44: 31-46 (1938); C.A., 32: 2410. SoH, SpVi, ThPh, ThSo

See also BIRNTHALER, W.; DOEHLEMAN, E.

LANGE, E., and MARTIN, W.

- (L-19) The heats of solution of salts in heavy water. Z. Elektrochem., 42: 662-668 (1936); C.A., 30: 7989. ThSo
- (L-20) Integral heats of solution L_m of sodium chloride in D_2O-H_2O mixtures at 25°. Z. physik. Chem., A178: 214-220 (1937); C.A., 31: 4196. ThSo
- (L-21) Isotope effect of the heat of solution of 99 salts and the non-electrolyte mercuric cyanide at 25°. Z. physik. Chem., A180: 233-245 (1937); C.A., 32: 35. ThSo

LANGE, E., MARTIN, W., and SATTLER, H.

- (L-22) The effect of isotopes in ion solvation and the heat of solution. Z. ges. Naturw., 1: 441-442 (1936); C.A., 31: 7324. ThSo

LANGE, E., and SATTLER, H.

- (L-23) Heats of solution and formation of hydrates of anhydrous copper sulfate in light and heavy water. Z. physik. Chem., A179: 427-444 (1937); C.A., 31: 8344. ThPh, ThSo

LANGER, R. M.

- (L-24) Diffusion technic for the separation of the isotopes of hydrogen. Phys. Rev., 40: 1047-1048 (1932); C.A., 27: 5006. SeDf

LANGSETH, A.

- (L-25) The rotatory power of the C-C single bond. Nord. Kjemiker-moete, Forh. 5: 174-177 (1939); Chem. Zentr., II: 2576 (1942); C.A., 38: 2269. InSt, SpVi

See also KLIT, A.

LANGSETH, A., BERNSTEIN, H.J., and BAK, B.

- (L-26) The hindered rotation in $\text{CH}_2\text{DCH}_2\text{Br}$. J. Chem. Phys., 8: 430-431 (1940); C.A., 34: 4664. SpVi

LANGSETH, A., and KLIT, A.

- (L-27) General chemical method for the preparation of the deuterated benzenes. Kgl. Danske Videnskab. Selskab, Mat. fys. Medd. 15, No. 13: 22 pp. (1937); C.A., 32: 2515. Sy

LANGSETH, A., and LORD, R.C., Jr.

- (L-28) The fine structure of the totally symmetrical Raman lines in benzene and benzene- d_6 . J. Chem. Phys., 6: 203-204 (1938); C.A., 32: 3695. SpVi
- (L-29) Raman spectra of the deuteriated benzenes. Kgl. Danske Videnskab. Selskab, Mat. fys. Medd. 16, No. 6: 85 pp. (1938); C.A., 33: 3263. SpVi

LANYI, B., and ARATO, J.

- (L-30) The heavy-water content of some medicinal springs of Budapest. Magyar Chem. Folyóirat 48: 73-76 (1942); Chem. Zentr., I: 499 (1943); C.A., 38: 3172. AbG

LARSEN, K.D.

See RANK, D.H.

LARSEN, T.

- (L-31) Refraction and dispersion of deuterium. Z. Physik, 100: 543-546 (1936); C.A., 30: 5851. ElSc
- (L-32) Refraction and dispersion of methane- d_4 . Z. Physik, 105: 164-167 (1937); C.A., 31: 5270. ElSc
- (L-33) Refraction and dispersion of hydrochloric acid, hydrobromic acid and hydrogen sulfide and of the isotopes of the heavy molecules DCl , DBr and D_2S . Z. Physik, 111: 391-398 (1938); C.A., 33: 3264. ElSc

LARSON, E. J.

See also BARNES, T. C.

LARSON, E. J., and BARNES, T. C.

(L-34) Parasitism in heavy water of low concentration. *Nature*, 133: 873-874 (1934); *C.A.*, 28: 5483. BiB

LARSON, K. D.

See WHITMORE, F. C.

LATIMER, W. M., and YOUNG, H. A.

(L-35) The isotopes of H by the magnetooptic method. The existence of H^3 . *Phys. Rev.*, 44: 690 (1933); *C.A.*, 28: 36. AnMg

LAWSON, M., and DUNCAN, A. B. F.

(L-36) The spectrum of deuterioacetone in the vacuum ultraviolet. A comparison with the spectrum of acetone. *J. Chem. Phys.*, 12: 329-335 (1934); *C.A.*, 38: 5456. SpEl

LAWSON, C. G.

See KING, A.

LAZAREV, V. (LASAREFF, W.)

See GOLDFINGER, P.; KALLMANN, H.

LECKIE, A. H.

(L-37) Raman spectrum of deuteriosulfuric acid (sulfuric acid- d_2). *Trans. Faraday Soc.*, 32: 1700-1705 (1936); *C.A.*, 31: 1702. SpVi, Sy

See also ANGUS, W. R.; BAILEY, C. R.

LEE, E., and WU, C. K.

(L-38) Infrared absorption spectra of AsH_3 , AsD_3 and PD_3 . *Trans. Faraday Soc.*, 35: 1366-1373 (1939); *C.A.*, 34: 1561. SpVi, Sy

LEEMAN, A.

(L-39) Sparking potential in deuterium and hydrogen. *Helv. Phys. Acta*, 12: 397-414 (1939); *C.A.*, 35: 2424. ElGd

LEFFLER, M. T., and ADAMS, R.

(L-40) Stereochemistry of the type $RR'CHD$. II. Succinic α -d, α' -d

LEFFLER, M. T., and ADAMS, R. (Continued)

acid and its derivatives. J. Am. Chem. Soc., 58: 1551-1555 (1936); C.A., 30: 7541. ElRo, Sy

- (L-41) Stereochemistry of the type $RR'CHD$. III. Camphane-2,3- d_2 . J. Am. Chem. Soc., 58: 1555-1558 (1936); C.A., 30: 7542. ElRo, Sy, ThPh

LEIGHTON, P. A.

See also CROSS, P. C.

LEIGHTON, P. A., and CROSS, P. C.

- (L-42) Exchange reactions with deuterium. II. The photochemical exchange between deuterium and hydrogen chloride. J. Chem. Phys., 6: 345-349 (1938); C.A., 32: 6136. KiP

LEMAITRE, G.

See also DELFOSSE, J. M.

LEMAITRE, G., MANNEBACK, C., and TCHANG, Y. L.

- (L-43) Calculation of the frequencies and modes of vibration of the monodeuteroethylene molecule. Ann. soc. sci. Bruxelles, 57: 120-128 (1937); C.A., 31: 6068. SpVi

LEMKE, H.

See TIEDE, E.

LEMONDE, H.

- (L-44) Viscosity of heavy water at different temperatures. Compt. rend. 212, No. 2: 81-83 (1941); C.A., 35: 6169. MeV

LENDLE, A.

See GEIB, K. H.

LENNARD-JONES, J. E., and DEVONSHIRE, A. F.

- (L-45) The interaction of atoms and molecules with solid surfaces. III. The condensation and evaporation of atoms and molecules. Proc. Roy. Soc. London, A156: 6-28 (1936); C.A., 30: 7413. ThF

LENNARD-JONES, J. E., and STRACHAN, C.

- (L-46) Interaction of atoms and molecules with solid surfaces. I. Activation of adsorbed atoms to higher vibrational states. Proc. Roy. Soc. London, A150: 442-455; C.A., 29: 5709. Ge

LESZEK, S.

- (L-47) The ability of deuterium oxide and its mixtures with ordinary water to exist as supercooled liquid. *Neues Jahrb. Mineral., Geol. I*: 795-796 (1939). *Roczniki Chem.*, 19: 317-322 (1939); C.A., 35: 3868. ThPh

LETANG, N. J.

See BROWN, W. G.

LEUNIG, H.

See LOCKEMANN, G.

LEVINA, S. (LEWINA, S.)

- (L-48) Exchange reaction between deuterium and hydrogen on nickel. *Acta Physicochim. U.R.S.S.* 14: 294-295 (1941); C.A., 36: 3091. AdG, KiG

LEWIS, C. M.

See BARNES, R. B.

LEWIS, G. N.

- (L-49) Isotopes of hydrogen. *J. Am. Chem. Soc.*, 55: 1297-1298 (1933); C.A., 27: 2092. SeEl
- (L-50) Simple type of isotopic reaction. *J. Am. Chem. Soc.*, 55: 3502-3503 (1933); C.A., 27: 4730. EqQ
- (L-51) Biochemistry of water containing hydrogen isotopes. *J. Am. Chem. Soc.*, 55: 3503-3504 (1933); C.A., 27: 4730. BiB
- (L-52) Biology of heavy water. *Science*, 79: 151-153 (1934); C.A., 28: 2733. BiB, BiZ
- (L-53) Different kinds of water. *Congr. intern. quím. pura y aplicada*, 9th Cong. Madrid, 2: 5-32 (1934); C.A., 29: 6139. Ge

LEWIS, G. N., and ASHLEY, M. F.

- (L-54) The spin of hydrogen isotope. *Phys. Rev.*, 43: 837 (1933); C.A., 27: 5636. NuS

LEWIS, G. N., and CORNISH, R. E.

- (L-55) Separation of the isotopic forms of water by fractional distillation. *J. Am. Chem. Soc.*, 55: 2616-2617 (1933); C.A., 27: 3394. SeDs, ThPh

LEWIS, G. N., and DOODY, T. C.

- (L-56) Mobility of ions in $\text{H}^2\text{H}_2\text{O}$. *J. Am. Chem. Soc.*, 55: 3504-3506 (1933); C.A., 27: 4730. EcC

LEWIS, G. N., and HANSON, W. T., Jr.

- (L-57) Vapor pressure of mixtures of light and heavy hydrogen. J. Am. Chem. Soc., 56: 1000-1001 (1934); C.A., 28: 2966. ThPh
- (L-58) Vapor pressure of solid and liquid heavy hydrogen. J. Am. Chem. Soc., 56: 1001-1002 (1934); C.A., 28: 2967. ThPh
- (L-59) The vapor pressure of solid and liquid deuterium and the heats of sublimation, of fusion and of vaporization. J. Am. Chem. Soc., 56: 1687-1690 (1934); C.A., 28: 6055. ThPh

LEWIS, G. N., and LUTEN, D. B., Jr.

- (L-60) Refractive index of H_2O^{18} and the complete isotopic analysis of water. J. Am. Chem. Soc., 55: 5061-5062 (1933); C.A., 28: 697. AnRf, ElRf

LEWIS, G. N., and MacDONALD, R. T.

- (L-61) Concentration of H^2 isotope. J. Chem. Phys., 1: 341-344 (1933); C.A., 27: 3664. AbG, SeEl
- (L-62) Some properties of pure $\text{H}^2\text{H}^2\text{O}$. J. Am. Chem. Soc., 55: 3057-3059 (1933); C.A., 27: 4147. MeD, ThPh
- (L-63) Viscosity of $\text{H}^2\text{H}^2\text{O}$. J. Am. Chem. Soc., 55: 4730-4731 (1933); C.A., 28: 15. MeV

LEWIS, G. N., MacDONALD, R. T., and SCHUTZ, P. W.

- (L-64) Vapor pressure of liquid and solid deutochloric acid (deuterium chloride). J. Am. Chem. Soc., 56: 494-495 (1934); C.A., 28: 1587. ThPh

LEWIS, G. N., OLSON, A. R., and MARONEY, W.

- (L-65) Dielectric constant of $\text{H}^2\text{H}^2\text{O}$. J. Am. Chem. Soc., 55: 4731 (1933); C.A., 28: 13. ELD

LEWIS, G. N., and SCHUTZ, P. W.

- (L-66) Some properties of pure deuteracetic acid (acetodeuteric acid). J. Am. Chem. Soc., 56: 493-495 (1934); C.A., 28: 1661. EqL, ThPh
- (L-67) Vapor pressure of liquid and solid deutocyanic acid (deuterium cyanide). J. Am. Chem. Soc., 56: 1002 (1934); C.A., 28: 2967. ThPh
- (L-68) Ionization constant of deuteracetic acid (deuterium acetate). J. Am. Chem. Soc., 56: 1002-1003 (1934); C.A., 28: 2967. EcC, EqI
- (L-69) Ionization of some weak electrolytes in heavy water. J. Am. Chem. Soc., 56: 1913-1915 (1934); C.A., 28: 7117. EcC, EqI

LEWIS, G. N., and SPEDDING, F. H.

- (L-70) A spectroscopic search for H^3 in concentrated H^2 . Phys. Rev., 43: 964-966 (1933); C.A., 27: 4164. AnMs

LEWIS, M. N.

See DIEKE, G. H.

LIBBY, W. F.

- (L-71) Vibrational frequencies of the isotopic water molecules; equilibria with the isotopic hydrogens. J. Chem. Phys., 11: 101-109 (1943); C.A., 37: 2627. EqH, SpVi

LIBBY, W. F., and BARTER, C. A.

- (L-72) Vapor pressures of the tritium liquid hydrogens. Dependence of hydrogen vapor pressure on mass of the molecule. J. Chem. Phys., 10: 184-186 (1942); C.A., 36: 2458. ThPh

LIBBY, W. F., and CORNOG, R.

- (L-73) Vapor pressure determination of HTO and DTO. Phys. Rev., 60: 171-172 (1941); C.A., 37: 2975. ThSo

LIBERALI, C. H.

- (L-74) The biological properties of heavy water. Rev. quim. e farm. Rio de Janeiro, 1: 59-62 (1935); C.A., 30: 1397. Bi

LIND, S. C., JUNGERS, J. C., and SCHIFLETT, C. H.

- (L-75) Polymerization of heavy acetylene by α -rays. Phys. Rev., 46: 825 (1934); C.A., 29: 51. KiR
(L-76) The polymerization of deuterioacetylene (acetylene- d_2) by α -rays. J. Am. Chem. Soc., 57: 1032-1034 (1935); C.A., 29: 5350. KiR, Sy

LIND, S. C., and SCHIFLETT, C. H.

- (L-77) Chemical action produced by alpha particles: the combination of deuterium and oxygen. J. Am. Chem. Soc., 57: 1051-1052 (1935); C.A., 29: 5350. KiR

LINDERSTROEM-LANG, K., JACOBSEN, O., and JOHANSEN, G.

- (L-78) Measurement of the deuterium content in mixtures of H_2O and D_2O . Compt. rend. trav. lab. Carlsberg, Sér. chim., 23: 17-25 (1938); C.A., 33: 4159. AnDn, MeD

LINDNER, J.

- (L-79) Heavy water. A review. Scientia Pharm., 5: 24-29 (1934); C.A., 28: 3978. Ge

LIOTTA, S.

See also GREENSPAN, J.

LIOTTA, S., and La MER, V. K.

(L-80) Hydrogen-deuterium exchange in acetate solution. *J. Am. Chem. Soc.*, 59: 946 (1937); *C.A.*, 31: 4567. EqQ

(L-81) The temperature coefficient of the base-catalyzed decomposition of nitramide in deuterium oxide. *J. Am. Chem. Soc.*, 60: 1967-1974 (1938); *C.A.*, 32: 8896. KiL

LOBECK, H.

See ERLENMEYER, H.

LOCKEMANN, G., and LEUNIG, H.

(L-82) The effect of heavy water on bacterial growth. *Ber.*, 67B: 1299-1302 (1934); *C.A.*, 28: 6744. BiB

LOHMAR, W.

See PETERS, K.

LOEBENSTEIN, A.

(L-83) A method for exchange of light hydrogen with deuterium in difficultly soluble substances. *Helv. Chim. Acta*, 23: 243-244 (1940); *C.A.*, 34: 4649. KiL

LOMBARD, V., and EICHNER, C.

(L-84) An attempt to fractionate the varieties of hydrogen by diffusion through palladium. *J. chim. phys.*, 31: 396-406 (1934); *C.A.*, 28: 7152. MeDf, SeDf

LONG, E. A.

See also JOHNSTON, H. L.

LONG, E. A., and KEMP, J. D.

(L-85) The entropy of deuterium oxide and the third law of thermodynamics. Heat capacity of deuterium oxide from 15° to 298°K. The melting point and heat of fusion. *J. Am. Chem. Soc.*, 58: 1829-1834 (1935); *C.A.*, 30: 7990. ThF, ThPh

LONG, R. W., HILDEBRAND, J. H., and MORRELL, W. E.

(L-86) The polymerization of gaseous hydrogen and deuterium fluorides. *J. Am. Chem. Soc.*, 65: 182-188 (1943); *C.A.*, 37: 1634. KiG

LONGSWORTH, L. G.

- (L-87) The densities of mixtures of light and heavy water. J. Am. Chem. Soc., 59: 1483-1484 (1937); C.A., 31: 7304. MeD

LONGSWORTH, L. G., and MacINNES, D. A.

- (L-88) Transference numbers and ion mobilities of some electrolytes in deuterium oxide and its mixtures with water. J. Am. Chem. Soc., 59: 1666-1670 (1937); C.A., 31: 8324. EcC

LORD, R. C., Jr.

- (L-89) Raman spectrum of benzene-d₆. J. Chem. Phys., 4: 82-83 (1936); C.A., 30: 1659. SpVi

See also LANGSETH, A.

LORD, R. C., Jr., AHLBERG, J. E., and ANDREWS, D. H.

- (L-90) Calculation of the heat-capacity curves of crystalline benzene and benzene-d₆. J. Chem. Phys., 5: 649-654 (1937); C.A., 31: 6957. ThF

LORD, R. C., Jr., and TELLER, E.

- (L-91) Structure of benzene. X. Remarks on the intensities of the Raman lines in benzene and hexadeuteriobenzene. J. Chem. Soc., 1937: 1728-1737; C.A., 32: 428. SpVi

LORING, F. H.

- (L-92) A hydrogen isotope. Chem. News, 144: 70-72 (1932); C.A., 26: 2647. Ge

LOW, G. W., Jr.

See BEEBE, R. A.

LOZIER, W. W.

See also SELWOOD, P. W.

LOZIER, W. W., SMITH, P. T., and BLEAKNEY, W.

- (L-93) H³ in heavy hydrogen. Phys. Rev., 45: 655 (1934); C.A., 28: 4306. AnMs

LUCAS, R.

- (L-94) Thermal dilatation of liquids. Compt. rend., 207: 900-901 (1938); C.A., 33: 446. MeD, MeV

LUCCHI, E.

See CAVALLARO, E.; MANZONI-ANSIDEI, R.

LUCKÉ, B., and HARVEY, E. N.

- (L-95) The permeability of living cells to heavy water (deuterium oxide). *J. Cellular Comp. Physiol.*, 5: 473-482 (1935); *C.A.*, 29: 4783. BiZ

LUEDER, H.

See JUSTI, E.

LUDLAM, E. B.

- (L-96) Heavy hydrogen, a significant discovery. A lecture. *Pharm. J.*, 131: 741-742 (1933); *C.A.*, 28: 2608. Ge
- (L-97) Heavy hydrogen and twentieth century chemistry. A lecture. *Pharm. J.*, 134: 88 (1935); *C.A.*, 29: 4661. Ge
- See also KING, D. W.

LUETGERT, I., and SCHROEER, E.

- (L-98) The kinetics of the thermal decomposition of oxalic acid in solution. *Z. physik. Chem.*, A187: 133-148 (1940); *C.A.*, 35: 4269. KiL

LUHR, O.

- (L-99) Triatomic ions in mixtures of the hydrogen isotopes. *J. Chem. Phys.*, 3: 146-149 (1935); *C.A.*, 29: 2841. AnMs

LUHR, O., and HARRIS, L.

- (L-100) Mass-spectrograph determination of the relative abundance of heavy hydrogen in a sample. *Phys. Rev.*, 45: 843 (1934); *C.A.*, 28: 4660. AnMs

LUKANOW, H., and SCHUETZE, W.

- (L-101) Mass spectrograph. *Z. Physik*, 82: 610-619 (1933); *C.A.*, 27: 4164. AnMs

LUNELUND, H.

- (L-102) Hydrogen and oxygen isotopes and heavy water. A review. *Tek. Foeren. i Finland Foerh.*, 55: 35-39 (1935); *C.A.*, 29: 3230. Se

LUTEN, D. B., Jr.

- (L-103) The refractive index of H_2^{18}O ; the refractive index and density of solutions of H_2^{18}O in H_2^{16}O . *Phys. Rev.*, 45: 160-165 (1934); *C.A.*, 28: 3958. ElRf, MeD

See also LEWIS, G. N.

MA, S. T.

- (M-1) Photomagnetic disintegration and magnetic moment of the deuteron in the meson theory. *Proc. Cambridge Phil. Soc.*, 36: 351-362 (1940); *C.A.*, 34: 7171. NuMg

MAASS, O.

See BROWN, R. S.; GIGUERE, P. A.; VAN CLEAVE, A. B.

MacDONALD, R. T.

See LEWIS, G. N.

McDOUGALL, E. J., VERZAR, F., ERLÉNMEYER, H., and
GAERTNER, H.

- (M-2) Heavy water in the animal body. *Nature*, 134: 1006-1007 (1934); *C.A.*, 29: 2187. AbO

McEWEN, G. F.

See FOX, D. L.

MacGILLAVRY, D.

- (M-3) Deuterium. I. *Chem. Weekblad*, 32: 490-493 (1935); *C.A.*, 30: 1296. SpDf
- (M-4) Deuterium. II. *Chem. Weekblad*, 32: 650-655 (1935); *C.A.*, 30: 1296. SeCr, ThPh
- (M-5) Deuterium. III. *Chem. Weekblad*, 32: 679-684 (1935); *C.A.*, 30: 3715. EqQ
- (M-6) The separation of isotopes by diffusion in fast-streaming mercury vapor. *Rec. trav. chim.*, 56: 330-342 (1937); *C.A.*, 31: 5263. SeDf

McGREW, F. C., and ADAMS, R.

- (M-7) Stereochemistry of deuterium compounds of the type $RR'CX_HX_D$: Ethyl- d_4 -ethylcarbinol. *J. Am. Chem. Soc.*, 59: 1497-1500 (1937); *C.A.*, 31: 6610. ElRo

MACHEMER, P. E.

See EDDY, R. D.

MACHT, D. I., and BRYAN, H. F.

(M-8) Effect of deuterium oxide on action of some enzymes. J. Am. Chem. Soc., 58: 729-731 (1936); C.A., 30: 4885. BiC, KiB

(M-9) Effect of deuterium oxide on action of some enzymes. Proc. Soc. Exptl. Biol. Med., 34: 190-193 (1936). BiC, KiB

MACHT, D. I., and DAVIS, M. E.

(M-10) Some pharmacological experiments with deuterium. J. Am. Chem. Soc., 56: 246 (1934); C.A., 28: 1728. BiB, BiZ

MacINNES, D. A.

See LONGSWORTH, L. G.

McKAY, H. A. C.

(M-11) Proportion of heavy water in natural water. Nature, 133: 611 (1934); C.A., 28: 4305. AbG

McKELLAR, A.

See also BRADLEY, C. A., Jr.

McKELLAR, A., and BRADLEY, C. A., Jr.

(M-12) The near infrared absorption spectrum of monodeuteroacetylene (acetylene- d_1). Phys. Rev., 46: 664-666 (1934); C.A., 29: 2084. SpVi

McLEAN, A., and ADAMS, R.

(M-13) Succinic- α - d_2 , α' - d_2 acid and its derivatives. J. Am. Chem. Soc., 58: 804-810 (1936); C.A., 30: 4818. ElRf, MeD, Sy, ThPh

McNAB, J.

See KHARASCH, M. S.

MacNAUGHTON, N. W.

See ANDERSON, L. C.

McQUILLEN, A.

See CLEMO, G. R.

MacWOOD, G. E.

See TEAL, G. K.

MacWOOD, G. E., and UREY, H. C.

(M-14) Raman Spectrum of methyl deuteride (methane-d). J. Chem. Phys., 3: 650-651 (1935); C.A., 29: 7799. SpVi

(M-15) Raman spectra of the deuteriomethanes. J. Chem. Phys., 4: 402-406 (1936); C.A., 30: 5886. SpVi, Sy

MAGAT, M.

See BAUER, E.

MAGNUS, A. and SARTORI, G.

(M-16) Calorimetric studies of the adsorption of light and heavy hydrogen on active nickel. Z. physik. Chem., A175: 329-341 (1936); C.A., 30: 2837. AdG

MAILLARD, A.

(M-17) Content of deuterium in light hydrocarbons of various petroleum. Compt rend., 203: 804-806 (1936); C.A., 31: 246. AbG

(M-18) Heavy water (heavy hydrogen) in petroleum. II. Congr. mondial pétrole, 2, Sect. 2, Phys. Chim., Raffinage: 139-140 (1937); C.A., 33: 351. AbG

MALAN-NELSON, A. M.

(M-19) Heavy hydrogen and heavy water. A review. Giorn. farm. chim., 84: 108-117 (1935); C.A., 29: 6835. Ge

MALYSHEV, V. I. (MALYCHEFF, V. I.)

See LANDSBERG, G. S.

MANIAN, S. H.

See CALDWELL, M. L.

MANN, W. B., and NEWELL, W. C.

(M-20) Accomodation coefficient of deuterium. Nature, 137: 662 (1936); C.A., 30: 4395. AdG

(M-21) The exchanges of energy between a platinum surface and hydrogen and deuterium molecules. Proc. Roy. Soc. London, A158: 397-403 (1937); C.A., 31: 2896. AdG

MANNEBACK, C.

(M-22) Plane fundamental modes of vibration of deuterioethylenes. J. Chem. Phys., 5: 989 (1937); C.A., 32: 1181. SpVi

See also BERNARD, E.; DELFOSSE, J. M.; LEMAITRE, G.; VERLEYSSEN, A.

MANNEBACK, C., and VERLEYSEN, A.

- (M-23) Provisional computation of the plane vibration frequencies of symmetrical deuterioethylenes. *Nature*, 138: 367 (1936); C.A., 30: 7453. SpVi
- (M-24) Calculations of the fundamental vibration frequencies of C_2H_4 , C_2D_4 and $C_2D_2H_2$. *Ann. soc. sci. Bruxelles*, 56B: 349-372 (1936); C.A., 31: 2512. SpVi

MANNING, M. F.

- (M-25) Energy levels for a potential function having symmetrical double minima and applications to the NH_3 and ND_3 molecules. *Phys. Rev.*, 46: 335 (1934). SpVi
- (M-26) Energy levels of a symmetrical double-minima problem with applications to the ammonia and ammonia- d_3 molecules. *J. Chem. Phys.*, 3: 136-138 (1935); C.A., 29: 2848. SpVi

MANZONI-ANSIDEI, R.

See also BONINO, G. B.; CAVALLARO, L.

MANZONI-ANSIDEI, R., and CARISSIMI, M.

- (M-27) Raman spectrum of *m*- and *p*-deuteroxybenzaldehyde. *Boll. sci. facoltà chim. ind. univ. Bologna*, 18: 135-136 (1940); C.A., 34: 7746. SpVi

MANZONI-ANSIDEI, R., and LUCCHI, E.

- (M-28) Raman spectrum of deuterioindene. *Ricerca sci. e ricostruz.*, 8, I: 423-424 (1937); C.A., 32: 4879. SpVi

MARIEENS, P.

See ITTERBEEK, A. van

MARK, H.

- (M-29) Heavy water in glacial ice. *Russ. Ger. Vestnik Nauki i Tekh.*, No. 9: 19 (1935). *Chem. Zentr.*, II: 1293 (1936); C.A., 32: 4023. AbG

MARK, H.

- (M-30) *Das schwere Wasser*. 32 pp., F. Deuticke, Leipzig, C.A., 28: 5760. Ge

MARK, H., and WALD, M.

- (M-31) Our present knowledge of heavy hydrogen and heavy water. *Protoplasma*, 23: 109-127 (1935); C.A., 29: 7793. Ge

MARON, S. H., and La MER, V. K.

- (M-32) Effect of deuterium substitution on color. *J. Chem. Phys.*, 6: 299 (1938); *C.A.*, 32: 4862. EtCl
- (M-33) Kinetics and neutralization of pseudo acids in H_2O and D_2O . *J. Am. Chem. Soc.*, 60: 2588-2596 (1938); *C.A.*, 33: 3240. KtL , Sy
- (M-34) Kinetics of the isomerization of aci- to nitro forms of nitroethane in water and deuterium oxide. *J. Am. Chem. Soc.*, 61: 692-696 (1939); *C.A.*, 33: 8093. KtL
- (M-35) Prototropy and deuterotropy in pseudo acids. *Ann. N.Y. Acad. Sci.*, 39, Art. 5: 355-373 (1940); *C.A.*, 35: 2777. EtL , KtL , ThF

MARONEY, W.

See LEWIS, G. N.

MARTIN, D. C.

- (M-36) Absorption spectrum of cobaltous chloride in deuterium oxide. *Nature*, 142: 756 (1938); *C.A.*, 33: 922. EtCl

MARTIN, D. C., and BUTLER, J. A. V.

- (M-37) The dissociation constants of some nitrophenols in deuterium oxide. *J. Chem. Soc.*, 1939: 1366-1369; *C.A.*, 34: 307. EtL

MARTIN, W.

See LANGE, E.

MASAKI, O., and MORIMOTO, Y.

- (M-38) Reaction of hydrogen and deuterium with spattered magnesium from electrodes. *J. Sci. Hiroshima Univ.*, 8A: 113-120 (1938); *C.A.*, 32: 5696. MeDf

MASCH, D. I.

See DIVIL'KOVSKII, M. A.

MASON, W. P.

See HOLDEN, A. N.

MATHESON, M. S.

See HERR, D. S.

MATOSI, F., and BLUSCHKE, H.

- (M-39) Reflective power of H_2O , HDO and D_2O in the infrared. *Z. Physik*, 104: 580-583 (1937); *C.A.*, 31: 5270. EtRf

MATTAUCH, J.

- (M-40) Methods and results of research on isotopes. *Physik. Z.*, 35: 567-621 (1934); C.A., 28: 6622. Ge
(M-41) Isotopy of the elements. A review. *Z. Ver. deut. Ing.*, 79: 1140-1144 (1935); C.A., 30: 1295. Ge

See also FLUEGGE, S.

MAXTED, E. B. and MOON, C. H.

- (M-42) The kinetics of the adsorption of hydrogen and deuterium by platinum. *J. Chem. Soc.*, 1936: 1542-1546; C.A., 31: 1282. AdG

MAYNEORD, W. V., and ROBERTS, J. E.

- (M-43) Absorption of short-wave length x-rays. *Nature*, 136: 793 (1935); C.A., 30: 1297. SpX

MEDICAL RESEARCH COUNCIL (London)

See OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT

MEERMAN, P. G.

See SMITS, A.

MEGAW, H. D.

- (M-44) Cell dimensions of ordinary and heavy ice. *Nature*, 134: 900-901 (1934); C.A., 29: 1709. CrX
(M-45) Density and compressibility of solid hydrogen and deuterium at 4.2°K. *Phil. Mag.*, 28: 129-147 (1939); C.A., 34: 300. MeD

MEGAW, H. D., and SIMON, F.

- (M-46) Density and compressibility of solid hydrogen and deuterium at 4.2°K. *Nature*, 138: 244 (1936); C.A., 30: 7006. MeD

MEHNERT, K.

- (M-47) Excitation of light in light and heavy hydrogen by 2,500- to 25,000-volt cesium ions. *Z. Physik*, 117: 41-54 (1940); C.A., 36: 6894. SpEl

MEISSNER, W.

- (M-48) Work in the Charlottenburg cryoscopic laboratory on superconductivity and on the hydrogen isotope. *Helv. Phys. Acta*, 6: 414-418 (1933); C.A., 29: 2413. ElD, ThSo

MEISSNER, W., and STEINER, K.

- (M-49) Vapor pressure of hydrogen after the accumulation of the heavier isotope. *Z. Physik*, 79: 601-612 (1932); *C.A.*, 27: 1818. ThPh

MELOT, G. J.

- (M-50) Effects of deuterium oxide on respiration of germinating seeds. *Proc. Soc. Exptl. Biol. Med.*, 32: 79-83 (1934); *C.A.*, 29: 1456, BiB

MELVILLE, H. W.

- (M-51) Catalytic hydrogenation of simple molecules by light and heavy hydrogen. *J. Chem. Soc.*, 1934: 797-805; *C.A.*, 28: 5322. KiG, KiP
- (M-52) Kinetics of reactions of heavy hydrogen. *Nature*, 133: 947 (1934); *C.A.*, 28: 5337. KiG
- (M-53) The kinetics of some reactions of heavy hydrogen. I. *J. Chem. Soc.*, 1934: 1243-1250; *C.A.*, 28: 7126. KiH, KiP
- (M-54) The effect of imprisonment of resonance radiation in the decomposition of ammonia and deuterioammonia. *Proc. Roy. Soc. London*, A152: 325-341 (1935); *C.A.*, 30: 963. KiP
- (M-55) Recent advances in science: physical chemistry. *Science Progress*, 31: 103-111 (1936); *C.A.*, 30: 6248. InKi, InSt
- (M-56) A note on the quantum yield of the photosensitized decomposition of water and of ammonia. *Proc. Roy. Soc. London*, A157: 621-624 (1936); *C.A.*, 31: 1296. KiP
- (M-57) Recent advances in science: Physical chemistry. The homogeneous reactions of heavy hydrogen. *Science Progress*, 31: 499-508 (1937); *C.A.*, 31: 2053. EqG, KiG

See also BOLLAND, J. L.; FARKAS, A.

MELVILLE, H. W., and BOLLAND, J. L.

- (M-58) Mercury-photosensitized exchange reaction of deuterium and phosphine. *Proc. Roy. Soc. London*, A160: 384-406 (1937); *C.A.*, 31: 8378. KiP, ThF

MELVILLE, H. W., BOLLAND, J. L. and ROXBURGH, H. L.

- (M-59) Photochemical decomposition and oxidation of tri- deuterio-phosphine (phosphine- d_3). *Proc. Roy. Soc. London*, A160: 406-423 (1937); *C.A.*, 31: 8381. KiP

MELVILLE, H. W., and RIDEAL, E. K.

- (M-60) The sorption of hydrogen and deuterium by copper and palladium. I. The behavior of copper and copper oxides. Proc. Roy. Soc. London, A153: 77-88 (1935); C.A., 30: 1631. AdG
- (M-61) The sorption of hydrogen and deuterium by copper and palladium. II. The sorption by palladium and diffusion through copper. Proc. Roy. Soc. London, A153: 89-103 (1935); C.A., 30: 1631. AdG, MeDf

MENDEL, H.

See BERTRAM, S. H.

MENDELEEV, I. (MENDELEJEV, J.)

- (M-62) Abnormal density of water from the depths of Lake Baikal. Compt. rend. acad. sci. U.R.S.S., 3: 105-108 (1935); C.A., 30: 1274. AbG

See also VERESCHCHAGIN, G. Y.

MENZIES, A. W. C.

See also EDDY, R. D.; MILES, F. T.; SHEARMAN, R. W.

MENZIES, A. W. C., and MILES, F. T.

- (M-63) Binding and interchange of water molecules in a salt hydrate. J. Am. Chem. Soc., 56: 1647-1648 (1934); C.A., 28: 5328. InKi, KiH

MEYER, H.

- (M-64) Breeding of algae in highly concentrated heavy water. Naturwissenschaften, 24: 346 (1936); C.A., 31: 119. BiB

MEYER, S. L.

- (M-65) Alleged stimulation of molds by paraffin in heavy water. Nature, 134: 665 (1934); C.A., 29: 822. BiB
- (M-66) Deuterium oxide and Aspergillus. Science, 79: 210-211 (1934); C.A., 28: 4756. BiB

See also SHOUP, C. S.

MICHEL, J.

- (M-67) Methods and apparatus in use at the Bureau of Physicochemical Standards. X. The rate of crystallization as a cri-

MICHEL, J. (Continued)

terion of purity of organic compounds. Bull. soc. chim. Belges., 48: 105-157 (1939). C.A., 33: 7650. ThD

See also TIMMERMANS, J.

MICHELS, A., and GOUDEKET, M.

(M-68) Compressibilities of deuterium between 0° and 150° up to 3000 atmospheres. Physica, 8: 353-359 (1941); C.A., 35: 7780. MeD

(M-69) Thermodynamic properties of hydrogen and deuterium up to 700 amagats between 0° and 150°C. Physica, 8: 387-397 (1941); C.A., 35: 7780. ThF

MIE, K.

(M-70) Resonance band systems of HD molecules between 1650 and 1000 Å. Z. Physik, 91: 475-492 (1934); C.A., 29: 1007. SpVi

See also BEUTLER, H.

MIGEOTTE, M. V.

See also BARKER, E. F.

MIGEOTTE, M. V., and BARKER, E. F.

(M-71) Resolution of the ND₃ bands at 13.5μ. Phys. Rev., 47: 812 (1935); C.A., 30: 7445. SpVi

(M-72) Fundamental absorption bands of the deuterioammonias. Phys. Rev., 50: 418-424 (1936); C.A., 30: 8022. SpVi

MIGHTON, C. J.

See BROWN, W. G.

MIHOLIC, S. S.

(M-73) Isotope of hydrogen and its properties. Bull. soc. chim. roy. Yougoslav., 4: 227-35 (1933); C.A., 28: 5327. Ge

MILAZZO, G.

(M-74) The ultraviolet absorption spectrum of pyrrole and of N-deuteriopyrrole in the gaseous phase. Spectrochim. Acta, 2: 245-251 (1942); C.A., 37: 5313. SpEl

MILES, F. T.

See also MENZIES, A. W. C.

MILES, F. T., and MENZIES, A. W. C.

- (M-75) The vapor pressure of deuterium water from 20° to 230°. J. Am. Chem. Soc., 58: 1067-1069 (1936); C.A., 30: 5849. MeD, ThPh
- (M-76) Solubilities of cupric sulfate and strontium chloride in deuterium water. J. Am. Chem. Soc., 59: 2392-2395 (1937); C.A., 32: 1164. SoH, ThPh
- (M-77) Dissociation pressure of deuteriates of cupric sulfate and strontium chloride. J. Am. Chem. Soc., 60: 87-90 (1938); C.A., 32: 2415. ThPh

MILES, F. T., SHEARMAN, R. W., and MENZIES, A. W. C.

- (M-78) Equilibria in salt systems with deuterium water. Nature, 138: 121 (1936); C.A., 30: 6624. EqL, SoH, ThPh

MILLER, F. A.

- (M-79) Preparation of several deuterium derivatives of pyrrole. J. Am. Chem. Soc., 64: 1543-1544 (1942); C.A., 36: 5812. SpVi, Sy

MILLMAN, S.

See KUSCH, P.

MILLS, G. A.

- (M-80) Dissociation of carbonic acid in ordinary and in heavy water. J. Am. Chem. Soc., 62: 449 (1940); C.A., 34: 1900. EqI

MINKOW, I.

See LACHS, H.

MIRCEV, A.

- (M-81) The problem of heavy water in sugar technology. Listy Cukrovar., 52: 317-319 (1934); C.A., 28: 6333. AbO, BiB
- (M-82) The problem of the so-called heavy water in the sugar industry. Z. Zuckerind. czechoslovak. Boehmen-Maehren, 59: 93-95 (1934); C.A., 29: 4197. BiB

MISHIMA, T.

See NAGAOKA, H.

MISHRA, B.

See BANERJI, G. B.

MITANI, M.

- (M-83) Exchange reaction between ammonia and hydrogen in the presence of platinum catalyst. I. Bull. Inst. Phys. Chem. Research, Tokyo, 18: 879-883 (1939); C.A., 34: 4971. KiH

MITCHELL, J. W.

See also HINSHELWOOD, C. N.

MITCHELL, J. W., and HINSHELWOOD, C. N.

- (M-84) Influence of hydrogen and deuterium on the thermal decomposition of diethyl ether in the low-pressure region. Proc. Roy. Soc. London, A162: 357-366 (1937); C.A., 31: 8332. KiG

MIZUSIMA, S. (MIZUSHIMA, S.), MORINO, Y., KITASATO, Y., and NAKAMURA, S.

- (M-85) Raman effect in ethanol, monodeuterioethanol and hexadeuterioethanol. Proc. Imp. Acad. Tokyo, 16: 549-554 (1940); C.A., 35: 2417. SpVi

MIZUSIMA, S., MORINO, Y., and OKAMOTO, G.

- (M-86) Raman spectrum of deuterioethanol (ethyl alcohol-d). Bull. Chem. Soc. Japan, 11: 553 (1936); C.A., 31: 36. SpVi

- (M-87) The Raman spectrum of methanol-d. Bull. Chem. Soc. Japan, 11: 698-699 (1936); C.A., 31: 2930. SpVi

MIZUSIMA, S., MORINO, Y., and SUGIURA, S.

- (M-88) Raman effect in tetradeutero-1,2-dibromoethane. Proc. Imp. Acad. Tokyo, 14: 250-251 (1938); C.A., 33: 39. SpVi, Sy

MIZUSIMA, S., MORINO, Y., and SUZUKI, A.

- (M-89) Raman effect and dipole moment in relation to free rotation. XI. Raman spectra of deuterio-1,2-dibromoethanes. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 36: 281-285 (1939); C.A., 34: 2707. SpVi, Sy

MOELWYN-HUGHES, E. A.

See also BACH, F.

MOELWYN-HUGHES, E. A.

- (M-90) The catalytic activity of the deuterium ion, H_3O^+ . Z. physik. Chem., B26: 272-280 (1934); C.A., 28: 7130. KiL, ThF

MOELWYN-HUGHES, E. A., and BONHOEFFER, K. F.

(M-91) Sucrose decomposition in heavy water. *Naturwissenschaften*, 22: 174 (1934); C.A., 28: 4977. KiL

MOELWYN-HUGHES, E. A., KLAR, R., and BONHOEFFER, K. F.

(M-92) The kinetics of the mutarotation of glucose in heavy water. *Z. physik. Chem.*, A169: 113-119 (1934); C.A., 28: 5742. KiL, ThF

MOGGI, S.

See SOUZA-REIS, F. de

MOLES, E.

(M-93) The atomic weight of hydrogen. *Anales, fís. y quím. Madrid*, 33: 721-728 (1935); C.A., 30: 661. NuM

MOLLER, C., and ROSENFELD, L.

(M-94) The electric quadripole moment of the deuteron and the field theory of nuclear forces. *Nature*, 144: 476-477 (1939); C.A., 33: 9114. NuMg

MOENCH, J.

See FRANKE, W.

MONTGOMERY, C. W.

See STORCH, H. H.

MOON, C. H.

See MAXTED, E. B.

MORAN, T.

See BROOKS, J.

MORGAN, S. O.

See HOLDEN, A. N.

MORGENSTERN, G.

See FEHER, F.

MORIKAWA, K.

(M-95) Reactivity of lower hydrocarbons. II. Extinction coefficients of deuteriomethanes and hexadeuterioethane and method of analysis. *J. Soc. Chem. Ind. Japan*, 41, Suppl. binding: 342-343 (1938); C.A., 33: 1598. KiG, SpVi, Sy

MORIKAWA, K. (Continued)

- (M-96) Reactivity of lower hydrocarbons. VII. Dry method for the analysis and separation of components of hydrocarbon gas mixture. *J. Soc. Chem. Ind. Japan*, 42, Suppl. binding: 129-133 (1939); C.A., 33: 8529. An
- (M-97) Reactivity of lower hydrocarbons. VIII. Mercury-sensitized reactions of methane, deuteriomethanes and the hydrogen isotopes (exchange reaction). *J. Soc. Chem. Ind. Japan*, 42, Suppl. binding: 133-137 (1939); C.A., 33: 8529. KiP
- (M-98) Reactivity of lower hydrocarbons. IX. Mercury-sensitized reactions of methane, deuteriomethanes and the hydrogen isotopes (condensation reaction). *J. Soc. Chem. Ind. Japan*, 42, Suppl. binding: 136-139 (1939); C.A., 33: 8529. KiP
- (M-99) Reactivity of lower hydrocarbons. X. Reactions between atomic deuterium and the saturated aliphatic hydrocarbons (experimental details). *J. Soc. Chem. Ind. Japan*, 42, Suppl. binding: 139-142 (1939); C.A., 33: 8530. EqQ
- (M-100) Reactivity of lower hydrocarbons. XI. Reactions between atomic deuterium and the saturated aliphatic hydrocarbons (discussion of results). *J. Soc. Chem. Ind. Japan*, 42, Suppl. binding: 142-145 (1939); C.A., 33: 8530. KiG

See also BENEDICT, W. S.; TAYLOR, H. S.; TRENNER, N. R.

MORIKAWA, K., BENEDICT, W. S., and TAYLOR, H. S.

- (M-101) Catalytic exchange of deuterium and methane. *J. Am. Chem. Soc.*, 57: 592-593 (1935); C.A., 29: 2842. KiH
- (M-102) Activation of specific bonds in complex molecules at catalytic surfaces. I. The carbon-hydrogen bond in methane and methane-d₄. *J. Am. Chem. Soc.*, 58: 1445-1449 (1936); C.A., 30: 6632. KiH
- (M-103) Activation of specific bonds in complex molecules at catalytic surfaces. II. Carbon-hydrogen and carbon-carbon bonds in ethane and ethane-d. *J. Am. Chem. Soc.*, 58: 1795-1800 (1936); C.A., 30: 7435. KiH, Sy
- (M-104) Mercury-sensitized reactions of methane, deuterio-methanes and the hydrogen isotopes. *J. Chem. Phys.*, 5: 212-225 (1937); C.A., 31: 3790. KiP

MORIKAWA, K., TRENNER, N. R., and TAYLOR, H. S.

- (M-105) Activation of specific bonds in complex molecules at catalytic surfaces. III. Carbon-hydrogen and carbon-carbon

MORIKAWA, K., TRENNER, N. R., and TAYLOR, H. S. (Continued)
bonds in propane and ethylene. *J. Am. Chem. Soc.*, 59:
1103-1111 (1937); *C.A.*, 31: 8340. AdG, EqH, InKi, KiH,
Sy

MORIMOTO, Y.
See MASAKI, O.

MORINO, Y.

(M-106) The bond frequency of heavy acetylene. *Sci. Papers Inst. Phys. Chem. Research Tokyo*, 25, No. 537: 232-234 (1934); *C.A.*, 29: 2084. SpVi

(M-107) Deformation frequencies of heavy acetylenes. *Sci. Papers Inst. Phys. Chem. Research Tokyo*, 27: 39-45 (1935); *C.A.*, 29: 5349. SpVi

See also MIZUSHIMA, S.

MORINO, Y., and MIZUSHIMA, S.

(M-108) Normal vibrations of heavy acetylene and of the ethylene halides. *Physik. Z.*, 36: 600-602 (1935); *C.A.*, 30: 681. SpVi

MORITA, N.

(M-109) Comparison of the density of Osaka (Japan) and Cambridge (U.S.A.) tap-water and the determination of the deuterium content in these waters. *J. Chem. Soc. Japan*, 58: 1151-1155 (1937); *C.A.*, 32: 1025. AbG

MORITA, N., and TITANI, T.

(M-110) Production of light water, and the determination of the deuterium concentration in normal water. *Bull. Chem. Soc. Japan*, 10: 257-258 (1935); *C.A.*, 29: 6835. AbG, Se

(M-111) Monodeuteriobenzene (benzene-d). *Bull. Chem. Soc. Japan*, 10: 557-558 (1935); *C.A.*, 30: 1751. EeRf, MeD, Sy, ThPh

(M-112) Production of light water and determination of the deuterium concentration of ordinary water. *Bull. Chem. Soc. Japan*, 11: 403-413 (1936); *C.A.*, 30: 7005. AbG, An

(M-113) Effect of the density difference between air- and water-oxygen on results on oxygen and hydrogen isotopes. *Bull. Chem. Soc. Japan*, 11: 419-424 (1936); *C.A.*, 30: 7000. AnDn

MORITA, N., and TITANI, T. (Continued)

(M-114) Redetermination of the deuterium-protium proportions in ordinary water Bull. Chem. Soc. Japan, 13: 419-426 (1938); C.A., 32: 8864. An

(M-115) Diffusion of heavy-hydrogen-enriched and heavy-oxygen-enriched water through dilute gelatin gel. Bull. Chem. Soc. Japan, 13: 543-555 (1938); C.A., 32: 8885. MeDf

MORITZ, H.

See SIEVERTS, A.

MORRELL, C. E.

See GLOCKLER, G.

MORRELL, W. M. E.

See LONG, R. W.

MORRIS, J. C.

(M-116) Thermal decomposition of acetaldehyde. J. Am. Chem. Soc., 63: 2535-2536 (1941); C.A., 35: 7370. InKi

MOSER, H.

(M-117) Sensitive float method for the determination of small changes in the density of liquids, particularly water. Physik. Z., 35: 682-683 (1934); C.A., 29: 2039. MeD

MOTZ, H., and PATAT, F.

(M-118) The ortho and para states of hydrogen of mass two. The variation of the heat of rotation of H_2^2 with temperature. Monatsh., 64: 17-20 (1934); C.A., 28: 3957. ThF

MOTZ, L., and RARITA, W.

(M-119) The photoelectric effect of deuterium. Phys. Rev., 52: 271-272 (1937); C.A., 31: 7328. NuM

MROZOWSKI, S.

(M-120) The band spectrum of ionized mercury deuteride. Acta Phys. Polon., 4: 405-418 (1935); Chem. Zentr., I: 2680 (1938); C.A., 33: 9133. SpVi

(M-121) The isotope-displacement effect in the band spectrum of mercury deuteride. Z. Physik. 99: 236-251 (1936); C.A., 30: 4064. SpVi

(M-122) Isotope effect in ionized mercury hydride. Z. Physik, 102: 545-547 (1936). SpVi

MROZOWSKI, S. (Continued)

- (M-123) Nuclear isotope shift in the spectra of HgH^+ and HgD^+ .
Phys. Rev., 58: 332-340 (1940); C.A., 34: 6880. SpVi

MROZOWSKI, S., and SZULC, M.

- (M-124) The isotope effect in the band spectra of ionized mercury
hydride ($\text{HgH}^+/\text{HgD}^+$). Acta Phys. Polon., 6: 44-57 (1937);
C.A., 32: 6547. SpVi

MUCKENTHALER, H.

- (M-125) Mass-spectrographic experiments on the isotopes of oxygen
and hydrogen. Physik. Z., 35: 851-857 (1934); C.A., 29:
2077. AnMs

MUELDER, O. W.

- (M-126) The transition temperature of deuteriates. Proc. Iowa Acad.
Sci., 46: 194-195 (1939); C.A., 34: 6874. ThPh

MUELLER, F. H.

- (M-127) Dipole moment of heavy water. Physik. Z., 35: 1009-1011
(1934); C.A., 29: 1709. EID

MUELLER, O. H.

- (M-128) Polarographic studies with the dropping-mercury cathode.
Secondary or catalytic effects in heavy water. Collection
Czechoslov. Chem. Commun., 7: 321-325 (1935); C.A.,
29: 7826. EcP

See also HEYROVSKY, J.

MUENZBERG, F. K.

- (M-129) Exchange experiments with trihydroxybenzenes and heavy
water. Z. physik. Chem., B33: 23-38 (1936); C.A., 30:
6270. EqQ
- (M-130) Exchange experiments with dihydroxybenzenes and heavy
water. Z. physik. Chem., B33: 39-46 (1936); C.A., 30:
6270. EqQ

MUENZBERG, F. K., and HAUROWITZ, F.

- (M-131) Action of heavy water on proteins and amino acids at body
temperature. Z. physiol. Chem., 256: 271-272 (1938);
C.A., 33: 2155. BiC

MUENZBERG, F. K., and OBERST, W.

- (M-132) Exchange experiments with organic compounds and heavy water. *Z. physik. Chem.*, B31: 18-22 (1935); *C.A.*, 30: 2549. EqQ

MULLER, G. J.

See SMITS, A.

MULLIKEN, R. S.

- (M-133) Symbols and names for the hydrogen isotopes. *Science*, 79: 228-229 (1934); *C.A.*, 28: 2608. No

MUND, W., KAERTKEMEYER, L., VANPEE, M., and TIGGELEN, A. van

- (M-134) Action of α -particles on an equimolecular mixture of hydrogen and deuterium. *Bull. soc. chim. Belges*, 49: 187-213 (1940); *C.A.*, 36: 26. KiR

MUNRO, L. A.

See ALEXANDER, W. A.

MURIN, A. N.

- (M-135) Efficiency of the thermodiffusion method for separation of isotopes. *Compt. rend. acad. sci. U.R.S.S.*, 42: 386-387 (1944); *C.A.*, 39: 1093. SeDf

See also ALKHAZOV, D.

MURPHY, G. M.

- (M-136) The temperature variation of some thermodynamic quantities. *J. Chem. Phys.*, 5: 637-641 (1937); *C.A.*, 31: 6953. EqG, ThF

See also BLAGG, J. C. L., CRIST, R. H., UREY, H. C.

MURPHY, G. M., and JOHNSTON, H.

- (M-137) Nuclear spin of deuterium. *Phys. Rev.*, 45: 550 (1934); *C.A.*, 28: 4305. NuS
- (M-138) Nuclear spin of deuterium. An abstract. *Phys. Rev.*, 45: 761 (1934). NuS
- (M-139) The nuclear spin of deuterium. *Phys. Rev.*, 46: 95-98 (1934); *C.A.*, 28: 6628. NuS

MURPHY, G. M., and VANCE, J. E.

(M-140) Raman spectra of gaseous, liquid and solid hydrogen sulfide. J. Chem. Phys., 5: 667 (1937); C.A., 31: 6969. SpVi

(M-141) Raman spectra of hydrogen and deuterium sulfides in the gas, liquid and solid states. J. Chem. Phys., 6: 426-429 (1938); C.A., 32: 7344. SpVi

MURRAY, J. W., SQUIRE, C. F., and ANDREWS, D. H.

(M-142) The Raman spectrum of deuteriobenzene ($C_6H_6^2$). J. Chem. Phys., 2: 714-715 (1934); C.A., 28: 7161. EqQ, SpVi

NACHOD, F. C.

- (N-1) Keto-enol tautomerism in light and heavy solution media. Z. physik. Chem., A182: 193-219 (1938); C.A., 33: 136. EqL, KiL, SoH

See also BRESCIA, F., La MER, V. K.

NAGAOKA, H., and MISHIMA, T.

- (N-2) Paschen series of hydrogen and deuterium. Proc. Imp. Acad. Tokyo, 13: 95-97 (1937); C.A., 31: 7332. SpA
- (N-3) High terms of Paschen series in hydrogen and deuterium. Proc. Imp. Acad. Tokyo, 14: 53-56 (1938); C.A., 32: 5696. SpA
- (N-4) Excitation of Balmer and Paschen series of hydrogen and deuterium by electrodeless discharge. Sci. Papers Inst. Phys. Chem. Research Tokyo 34: 931-956 (1938); C.A., 32: 8928. SpA

NAKAMURA, S.

See MIZUSIMA, S.

NAKAO, T., IMASE, H., and IHASHI, S.

- (N-5) Pharmacological action of deuterium oxide (preliminary report). Sei-i-kai Med. J., 56, No. 4: 533-549 (1937); C.A., 31: 8570. BiZ

NARAYAN, A. L.

- (N-6) A new (2-2) band in the spectrum of the OD molecule. Current Sci. India, 10: 75 (1941); C.A., 35: 5790. SpEl

NEAMTAN, S. M.

See FOSTER, J. S.

NEHRA, V., and QURESHI, M.

- (N-7) Diamagnetic susceptibility of heavy water. Current Sci. India, 5: 533 (1937); C.A., 31: 5232. ElMg

NELSON, W. E., and BUTLER, J. A. V.

- (N-8) Experiments with heavy water on the acid hydrolysis of esters and the alkaline decomposition of diacetone alcohol. J. Chem. Soc., 1938: 957-962; C.A., 32: 7805. KiL

NEUMANN, K., and TOHMFOR, G.

- (N-9) Can the difference in density between sea water and fresh water be explained by the fractional distillation of the water isotopes? Z. physik. Chem., A176: 226-228 (1936); C.A., 30: 6615. AbG

NEVELL, T. P., SALAS, E. de, and WILSON, C. L.

- (N-10) Use of isotopes in chemical reactions. I. The mechanism of the Wagner-Meerwin rearrangement. Exchange of radioactive chlorine and deuterium between camphene hydrochloride and hydrogen chloride. J. Chem. Soc., 1939: 1188-1199; C.A., 33: 7766. InKi

NEWELL, I. L., and FICKLEN, J. B.

- (N-11) Concentration of the heavy hydrogen isotope. J. Am. Chem. Soc., 55: 2167 (1933); C.A., 27: 2876. SeEl

NEWELL, W. C.

See also MANN, W. B.

NEWELL, W. C., PURCELL, R. H., GREGORY, H. S., and ELLINGHAM, H. J. T.

- (N-12) Thermal-conductivity method for following the electrolytic separation of hydrogen isotopes. Nature, 137: 69-70 (1936); C.A., 30: 2500. AnTh, SeEl

NIELSEN, A. H.

- (N-13) The infrared absorption spectrum of the deuterioacetylenes. An abstract. Phys. Rev., 57: 346 (1940); C.A., 35: 4685. SpVi

See also NIELSEN, H. H.

NIELSEN, A. H., and NIELSEN, H. H.

- (N-14) Infrared absorption spectrum of HDS_2 and D_2S . J. Chem. Phys., 4: 229 (1936); C.A., 30: 2845. SpVi, Sy
- (N-15) Infrared absorption spectrum of the deuterium sulfides. J. Chem. Phys., 5: 277-283 (1937); C.A., 31: 4593. SpVi

NIELSEN, A. H., and NIELSEN, H. H. (Continued)

- (N-16) The infrared absorption spectrum of methyl- d_3 chloride. Revs. Mod. Phys., 16: 241-244 (1944); C.A., 39: 4284. SpVi

NIELSEN, H. H.

See also CAMERON, D. M.; EBERS, E. S.; NIELSEN, A. H.

NIELSEN, H. H., and NIELSEN, A. H.

- (N-17) The optically active CD_4 fundamental bands. Phys. Rev., 51: 62-63 (1937); C.A., 32: 5292. SpEl

NIELSEN, L. E.

See REDLICH, O.

NITTA, I., and SUENAGA, K.

- (N-18) The anomalous specific heat of deuterioammonium chloride, ND_4Cl , in the crystalline state. Sci. Papers Inst. Phys. Chem. Research Tokyo, 32: 83-86 (1937); C.A., 31: 7323. Sy, ThF
- (N-19) The thermal transition in solid deuterioammonium sulfate (ammonium- d_4 sulfate), $(NO_4)_2SO_4$. Bull. Chem. Soc. Japan, 13: 36-41 (1938); C.A., 32: 4063. ThF

NIWA, K., and SIMAZAKI, E.

- (N-20) Determination of the vapor pressure of solutions. II. Vapor pressure of deuterium oxide solution of potassium chloride. J. Chem. Soc. Japan, 60: 985-994 (1939); C.A., 34: 1537. ThPh
- (N-21) Determination of the vapor pressure of solutions. II. Vapor pressure of deuterium oxide solution of potassium chloride. J. Faculty Sci., Hokkaido Imp. Univ., Ser. III, 3: 35-51 (1940); C.A., 35: 2773. ThPh

NOETHER, H. D.

- (N-22) Infrared spectrum of polyatomic molecules. XVI. Methyl- d_3 chloride and methyl- d_3 bromide, J. Chem. Phys., 10: 665-668 (1942); C.A., 37: 312. SpVi, Sy
- (N-23) Infrared and Raman spectra of polyatomic molecules. XVIII. Methyl- d_3 -alcohol- d and methyl- d_3 -alcohol. J. Chem. Phys., 10: 693-699 (1942); C.A., 37: 831. SpVi, Sy

NOGUCHI, T. (NOGUTI, T.)

- (N-24) Electrolytic production of heavy water. Relation between current density and isotope separation coefficient. J. Electrochem. Assoc. Japan, 3: 305-310 (1935); C.A., 30: 2498. SeEl
- (N-25) Electrolytic winning of heavy water. IV. J. Electrochem. Assoc. Japan, 6: 299-303 (1938); Rev. Phys. Chem. Japan, 13: 50 (1939); C.A., 34: 7757. SeEl

See also PATENTS, JAPANESE

NOGUTI, K.

See SIBATA, Y.

NOGUTI, T.

See NOGUCHI, T.

NOONAN, E.

See also La MER, V. K.

NOONAN, E., and La MER, V. K.

- (N-26) Thermodynamics of strong electrolytes in protium oxide-deuterium oxide mixtures. I. Hydrogen chloride. J. Phys. Chem., 43: 247-258 (1939); C.A., 33: 2791. EcP, ThF

NORDHAGEN, J.

See TRONSTAD, L.

NORDHEIM, G.

See SPONER, H.

NORDSIECK, A.

- (N-27) The value of the electric quadripole moment of the deuteron. Phys. Rev., 58: 310-315 (1940); C.A., 34: 6879. NuMg

NORLING, F.

- (N-28) The electrolytic preparation of deuterium from heavy water. Physik, Z., 36: 711-713 (1935); C.A., 30: 1309. Sy
- (N-29) The band spectra of the ionized hydrogen halides. II. Hydrogen chloride and deuterium chloride spectra. Z. Physik, 104: 638-652 (1937); C.A., 31: 4899. SpEl

NORLING, F. (Continued)

- (N-30) The band spectra of the ionized hydrogen halides. III. Fine structure and isotope effect in the hydrogen chloride and deuterium chloride spectra. Term values. Z. Physik, 106: 177-204 (1937); C.A., 31: 7752. SpEl

NORRIS, W. V., UNGER, H. J., and HOLMQUIST, R. E.

- (N-31) An infrared absorption band of heavy-water vapor. Phys. Rev., 49: 272 (1936); C.A., 30: 2105. SpVi

NOTHDURFT, W.

- (N-32) Heat conductivity of deuterium. Ann. Physik, 28: 157-158 (1937); C.A., 31: 2081. ThD

NOVAK, J.

- (N-33) Polarographic studies with the dropping mercury cathode. LXVIII. Hydrogen overpotential in light and heavy water. Collection Czechoslov. Chem. Commun., 9: 207-237 (1937); C.A., 31: 7764. EcO

OBERST, W.

See MUENZBERG, F. K.

ODDIE, T. H.

- (O-1) Efficiency of separation of hydrogen and deuterium by electrolysis. *Proc. Phys. Soc. London*, 47: 1060-1067 (1935); *C.A.*, 30: 1309. SeEl

OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT (Washington) and MEDICAL RESEARCH COUNCIL (London)

- (O-2) Chemistry of penicillin. *Science*, 102: 627-629 (1945). EqQ

OGAWA, E.

- (O-3) The exchange reactions between heavy water and hydrogen compounds. *J. Chem. Soc. Japan*, 56: 1180-1183 (1935); *C.A.*, 30: 2473. EqL
- (O-4) The exchange reactions between heavy water and hydrogen compounds. II. *J. Chem. Soc. Japan*, 57: 104-111 (1936); *C.A.*, 30: 3703. EqL
- (O-5) Exchange reactions between heavy water and hydrogen compounds. *Bull. Chem. Soc. Japan*, 11: 310-320 (1936); *C.A.*, 30: 5080. EqL
- (O-6) The exchange reactions between heavy water and amino acids and carbohydrates. *Bull. Chem. Soc. Japan*, 11: 367-374 (1936); *C.A.*, 30: 6327. EqL, KiL
- (O-7) Mechanism of isotopic exchange reactions. *Bull. Chem. Soc. Japan*, 11: 425-427 (1936); *C.A.*, 30: 7448. EqH, EqI
- (O-8) Optical rotation of 1-menthol in heavy methanol. *Bull. Chem. Soc. Japan*, 12: 545-546 (1937); *C.A.*, 32: 2917. ElRo

OGDEN, G.

See APPLEBEY, M. P.; BAWN, C. E. H.; HORIUCHI, J.; HUDSON, J. H.

OKABE, K.

See also GOTO, K.; TITANI, T.

OKABE, K., HARADA, M., and TITANI, T.

- (O-9) Content of deuterium in water of crystallization. Bull. Chem. Soc. Japan, 9: 460-461 (1934); C.A., 29: 999. AbG

OKABE, K., and TITANI, T.

- (O-10) The concentration of heavy isotopes in cellulose. Bull. Chem. Soc. Japan, 10: 465-466 (1935); C.A., 30: 356. AbO
(O-11) The heavy-water content of atmospheric moisture. Bull. Chem. Soc. Japan, 12: 11-15 (1937); C.A., 31: 4546. AbG

OKAMOTO, G.

- (O-12) Partition of deuterium between methyl alcohol and water. Sci. Papers Inst. Phys. Chem. Research Tokyo, 31: 211-216 (1937); J. Faculty Sci. Hokkaido Imp. Univ., Ser. III, 2: 81-87 (1936); C.A., 31: 4189. EqL, Sy
(O-13) Interchange equilibrium of deuterium; number of interchangeable hydrogen atoms in complex salts. J. Faculty Sci. Hokkaido Imp. Univ., Ser. III, 2: 81-83, 88-94 (1936); C.A., 31: 4878. EqL
(O-14) The mechanism of the hydrogen electrode. J. Faculty Sci. Hokkaido Imp. Univ. Ser. III, 2: 115-182 (1937); C.A., 32: 6116. EqH, KiH, SeEl

See also HIROTA, K.; HORIUCHI, J.; MIZUSIMA, S.

OKAMOTO, G., and ABE, S.

- (O-15) Determination of the number of the mutually interchangeable hydrogen atoms of complex compounds with heavy water. J. Chem. Soc. Japan, 57: 1175-1178 (1936); C.A., 31: 966. EqL

OKAMOTO, G., HORIUCHI, J., and HIROTA, K.

- (O-16) Application of the transition-state method to the heterogeneous reaction on the hydrogen electrode. Absolute calculation of isotopic interchange reaction velocity, cathodic and anodic currents, and isotopic separation factor. Sci. Papers Inst. Phys. Chem. Research Tokyo, 29: 223-251 (1936); C.A., 31: 26. KiL, SeEl

OKAMOTO, G., and KWAN, T.

- (O-17) Interchange equilibrium between deuterium and methyl alcohol. J. Chem. Soc. Japan, 57: 1179-1189 (1936); C.A., 31: 931. EqL

OKAMOTO, G., and SHINDO, M.

- (O-18) Micropycnometer. J. Chem. Soc. Japan, 57: 609-613 (1936); C.A., 30: 6241. AnDn

OKAZAKI, A.

- (O-19) Magneto-optical rotation and natural dispersion of heavy water. Proc. Phys. Math. Soc. Japan, 19: 286-294 (1937); C.A., 31: 4875. ElMr, ElRf
- (O-20) Magneto-optical anomaly of ordinary and heavy water. Proc. Phys. Math. Soc. Japan, 21: 753-758 (1939); C.A., 34: 2709. ElMg, ElRo

OKAZAKI, N.

- (O-21) Self-exchange reaction of aniline hydrochloride and its derivatives. I. Aniline hydrochloride. J. Chem. Soc. Japan, 62: 52-56 (1941); C.A., 37: 4058. EqL, InKi

OKAZAKI, N., and KURODA, Z.

- (O-22) Self-exchange reaction of aniline hydrochloride and its derivatives. II. *p*-Toluidine hydrochloride. J. Chem. Soc. Japan, 62: 57-61 (1941); C.A., 37: 4059. EqL, InKi

OLIPHANT, M. L.

- (O-23) Heavy hydrogen in contact with normal water. Nature, 132: 675 (1933); C.A., 28: 1265. EqH

OLIVERI-MANDALA, E., and INDOVINA, R.

- (O-24) Effect of deuterium oxide on the catalytic decomposition of hydrogen peroxide with colloidal solutions of platinum. Gazz. chim. ital., 67: 53-55 (1937); C.A., 32: 2414. KiH

OLMER, F.

See THOMAS, L. B.

OLSEN, L. O.

- (O-25) The mechanism of formation of mercury hydride and mercury deuteride. Optical excitation of cadmium deuteride. J. Chem. Phys., 6: 307-310 (1938); C.A., 32: 6156. InSt, SpEl

OLSEN, N. G.

See FRIVOLD, O. E.

OLSON, A. R.

See LEWIS, G. N.

OLSSON, E.

- (O-26) Isotope effect in the band spectrum of sodium hydride. *Nature*, 134: 697-698 (1934); *C.A.*, 29: 1008. SpEl
- (O-27) The absorption spectrum of sodium hydride-d. *Z. Physik*, 93: 206-219 (1934); *C.A.*, 29: 2847. SpVi
- (O-28) Errata: The absorption spectrum of NaD. *Z. Physik*, 93: 816 (1935). SpVi

ONSAGER, L.

- (O-29) Separation of gas (isotope) mixtures by irreversible processes. *Phys. Rev.*, 55: 1136-1137 (1939); *C.A.*, 34: 4981. Ge
- (O-30) Separation of isotopes by thermal diffusion. *Phys. Rev.*, 57: 562 (1940); *C.A.*, 35: 4686. SeDf

ORBAN, G.

- (O-31) Concentration of heavy water within the human organism. *Orvosi Hetilap*, 79: 193-194 (1935); *C.A.*, 29: 2980. AbO

ORFIELD, H. M.

See BEEBE, R. A.

ORR, W. J. C.

- (O-32) Refractive index of heavy hydrogen. *Nature*, 135: 793 (1935); *C.A.*, 29: 4648. ElRf
- (O-33) The refractive index of deuterium. *Trans. Faraday Soc.*, 32: 1556-1559 (1936); *C.A.*, 31: 1268. ElRf
- (O-34) The exchange of deuterium between deuterium hydroxide and ethyl alcohol. *Trans. Faraday Soc.*, 32: 1033-1037 (1936); *C.A.*, 30: 7428. EqL, KiL, KiL

ORR, W. J. C., and BUTLER, J. A. V.

- (O-35) The rate of diffusion of deuterium hydroxide in water. *J. Chem. Soc.*, 1935: 1273-1277; *C.A.*, 30: 358. MeDf
- (O-36) Kinetic and thermodynamic activity of protons and deuterons in water-deuterium oxide solutions. *J. Chem. Soc.*, 1937: 330-335; *C.A.*, 31: 3767. EqI, EqL, KiL, ThF

ORR, W. J. C., and THOMSON, D. W.

- (O-37) Diffusion of heavy into light water. *Nature*, 134: 776 (1934); *C.A.*, 29: 999. MeDf

OSERD, L. S.

See VEGARD, L.

OTA, Y.

- (O-38) Concentration of deuterium by the electrolysis of water. I. Mem. Faculty Sci. Agr. Taihoku Imp. Univ., 10: 71-79 (1934); C.A., 29: 2442. SeEl
- (O-39) Concentrating the hydrogen isotope, D, by electrolysis of water. II. Production of heavy water and apparatus. Mem. Faculty Sci. Agr. Taihoku Imp. Univ., 15: 165-170 (1935); C.A., 30: 5131. SeEl
- (O-40) Emission band spectrum of the OD molecule. Mem. Faculty Sci. Agr. Taihoku Imp. Univ., 15: 181-191 (1935); C.A., 30: 5123. SpEl, SpVi

OTVOS, J. W., and EDSALL, J. T.

- (O-41) Raman spectra of deuterium-substituted guanidine and urea. J. Chem. Phys., 7: 632 (1939); C.A., 33: 8116. SpVi

OUELLET, C.

- (O-42) Heavy hydrogen and heavy water. A review. Naturaliste canadien, 61: 205-211 (1934); C.A., 29: 2442. Ge

See also KING, T.

PACE, J., and TAYLOR, H. S.

- (P-1) Velocities of adsorption of hydrogen and deuterium on hydrogenation catalysts. J. Chem. Phys., 2: 578-580 (1934); C.A., 28: 6606. AdG

PACSU, E.

- (P-2) Mutarotation of α -*D*-glucose in heavy water. J. Am. Chem. Soc., 55: 5056-5057 (1933); C.A., 28: 744. ElRo, KiL
- (P-3) Alcoholic fermentation of *D*-glucose in deuterium water. J. Am. Chem. Soc., 56: 245-246 (1934); C.A., 28: 1728. KiL
- (P-4) Mutarotation of α -*D*-glucose in deuterium water. J. Am. Chem. Soc., 56: 745-746 (1934); C.A., 28: 2681. ElRo, KiL

PAEMEL, O. van

See ITTERBEEK, A. van

PARLEE, N. A. D.

See STEACIE, E. W. R.

PARPART, A. K.

- (P-5) The permeability of the mammalian erythrocyte to deuterium oxide (heavy water). J. Cellular Comp. Physiol., 7: 153-162 (1935); C.A., 30: 1405. BiZ

PARRAVANO, N., and PESCE, B.

- (P-6) Isotopic composition of natural waters. Atti Congr. intern. chim. 10th Congr., Rome, 2: 401-411 (1938); C.A., 33: 7662. AbG
- (P-7) Isotopic composition of rain waters. Atti Congr. intern. chim. 10th Congr., Rome, 2: 412-415 (1938); C.A., 33: 7662. AbG

PARTINGTON, J. R., and STRATTON, K.

- (P-8) Heavy water of crystallization. Nature, 137: 1075-1076 (1936); C.A., 30: 5860. ThPh

PARTINGTON, J. R., and TOWNDROW, R. P.

(P-9) Heterogeneous equilibria with deuterium. *Nature*, 140: 156 (1937); *C.A.*, 31: 7316. EqH

(P-10) Reduction of cuprous and cobalt chlorides by deuterium. *Trans. Faraday Soc.*, 35: 553-559 (1939); *C.A.*, 33: 5266. EqH

PARTRIDGE, S. M.

See COPPOCK, J. B. M.

PASTERNAK, S.

(P-11) The fine structure of $H\alpha$ and $D\alpha$. *Phys. Rev.*, 54: 1113 (1938); *C.A.*, 33: 1212. SpA

PATAT, F.

(P-12) Ortho-para D_2 . *Verhandl. deutsch. physik. Ges., Wien* (6): 2 (1934). EqG

See also HERZBERG, G.; MOTZ, H.

PATENTS, BRITISH

HANSGIRG, F.

(P-13) Pat. 462,191: March 4, 1937; Heavy water. *C.A.*, 31: 5524. SeCh

(P-14) Pat. 487,066: June 15, 1938; Heavy water. *C.A.*, 32: 9415. SeCh

KNOWLES, A. E.

(P-15) Pat. 435,450: Sept. 23, 1935; Heavy water and hydrogen. *C.A.*, 30: 1671. SeEl

PATENTS, FRENCH

KNOWLES, A. E.

(P-16) Pat. 789,822: Nov. 7, 1935; Heavy water. *C.A.*, 30: 2860. SeEl

PATENTS, GERMAN

FARBENIND., A.-G., I. G. (Georg Pfleiderer, inventor)

(P-17) Pat. 623,336: Dec. 5, 1935; Heavy water and deuterium. *C.A.*, 30: 2119. SeEl

HANSGIRG, F.

(P-18) Pat. 674,965: April 26, 1939; Heavy water. *C.A.*, 33: 7054. SeCh

PATENTS, GERMAN (Continued)

KNOWLES, A. E.

- (P-19) Pat. 666,393: Sept. 29, 1938; Heavy water and hydrogen.
C.A., 33: 2294. SeEl

PATENTS, JAPANESE

NOGUTI, T., and AWADA, M. (to Rikagaku Kenkyusho)

- (P-20) Pat. 128,676: Feb. 6, 1939; Electrodes for the concentration of deuterium by electrolysis. C.A., 34: 7764. SeEl

PATENTS, NORWEGIAN

Norsk. Hydro-Elektrisk Kvaestofaktieselskab.

- (P-21) Pat. 58,326: Aug. 30, 1937; Deuterioparaffins. C.A., 32: 2541. Ge

PATENTS, UNITED STATES

BREWER, A. K., and BRAMLEY, A. (to the Secretary of Agriculture of the U.S.A. and his successors in office).

- (P-22) Pat. 2,258,594: Oct. 14, 1941; Separation of gases and isotopes. C.A., 36: 346. SeDf

HANSGIRG, F.

- (P-23) Pat. 2,156,851: May 2, 1939; Production of heavy water.
C.A., 33: 6538. SeCh

KNOWLES, A. E.

- (P-24) Pat. 2,044,704: June 16, 1936; Concentrating heavy water.
C.A., 30: 5511. SeEl

PEGRAM, G. B. (to the Chemical Foundation, Inc.)

- (P-25) Pat. 2,218,342: Oct. 15, 1940; Distillation column suitable for producing heavy water. C.A., 35: 936. SeDs

SLEPIAN, J. (to Westinghouse Elec. and Mfg. Co.)

- (P-26) Pat. 2,285,622: June 9, 1942; Ion generator suitable for use with heavy hydrogen, etc. C.A., 36: 6426. ElGd

WASHBURN, E. W. (To Am. Security and Trust Co., as trustee).

- (P-27) Pat. 2,108,570: Feb. 15, 1938; Waters of different densities. C.A., 32: 2851. SeEl

WEBB, W. A.

- (P-28) Pat. 2,137,430: Nov. 22, 1939; Concentrating isotopes such as those of hydrogen and oxygen derived from water.
C.A., 33: 1606. SeEl

PATTERSON, W. H.

- (P-29) Estimation of deuterium oxide-water mixtures. J. Chem. Soc., 1937: 1745-1746; C.A., 32: 1164. MeD
- (P-30) Estimation of deuterium oxide-water mixture. II. Solubility curves with normal and iso-butyric acid. J. Chem. Soc., 1938: 1559-1561; C.A., 33: 917. SoH

PATTERSON, W. I., and VIGNEAUD, V. du

- (P-31) The synthesis of tetradeuterohomocystine and dideuteromethionine. J. Biol. Chem., 123: 327-334; C.A., 32: 3338. Sy

PAYMAN, W., and TITMAN, H.

- (P-32) Limits of inflammability of hydrogen and deuterium in oxygen and in air. Nature, 137: 190 (1936); C.A., 30: 2816. KiG

PEARSE, R. W. B.

- (P-33) Spectroscopy II. Isotope effects in the spectra of diatomic hydrides. Phys. Soc. Rep. Progress Phys., 2: 332-337 (1935). SpEl

See also HARRIS, L.; ISHAQ, M.

PEARSE, R. W. B., and ISHAQ, M.

- (P-34) Spin coupling in the $^3\Sigma$ state of phosphorus deuteride. Nature, 137: 457 (1936); C.A., 30: 3323. SpEl

PEARSON, T. G.

See ANDERSON, J. S.; EMELEUS, H. J.

PEASE, R. N.

See also WHEELER, A.

PEASE, R. W., and WHEELER, A.

- (P-35) Relative rates of combination of light and heavy hydrogen with ethylene. J. Am. Chem. Soc., 57: 1144-1145 (1935); C.A., 29: 4984. KiG

PECHERER, B.

See HALFORD, J. O.

PEGRAM, G. B.

See PATENTS, U.S.

PEREIRA-FORJAZ, A. de

- (P-36) Action of deuterium oxide on the phosphatase and fumarase enzyme systems. *Bull. soc. chim. biol.*, 18: 926-931 (1936); *C.A.*, 30: 6770. BiC, KiB
- (P-37) Investigations on the mechanics of fermentation in presence of heavy water. *Congr. chim. ind. Compt. rend.* 17^{ème} Congr. Paris, Sept.-Oct. (1937); *C.A.*, 32: 6394. BiC, KiB
- (P-38) Mechanism of fermentation in presence of heavy water. *Congr. chim. ind. Compt. rend.* 18^{ème} Congr, Nancy, Sept.-Oct. 736-740; (1938); *C.A.*, 33: 5977. BiC, KiB

PEREIRA-FORJAZ, A., JACOBSON, K. P., and TAPADINHAS, J.

- (P-39) Enzyme equilibrium in the presence of heavy water; experiments with fumarases. *Bull. soc. chim. biol.*, 19: 1194-1199 (1937); *C.A.*, 32: 961. BiC, KiB
- (P-40) Influence of deuterium oxide on enzymic action of aconitases. *Bull. Soc. Port. Sci. Nat.*, 13: 37-41 (1939); *C.A.*, 37: 4079. BiC, KiB
- (P-41) Intervention of deuterium in enzymic processes. *Bull. Soc. Port. Sci. Nat.*, 13: 71-73 (1940); *C.A.*, 37: 4079. BiC

PERPEROT, H., and SCHACHERL, F.

- (P-42) A modification of the method of Goldfinger and Scheepers for the determination of small quantities of heavy water. *J. phys. radium*, 6: 319-322 (1935); *C.A.*, 30: 5145. AnDn
- (P-43) Differential tensionmeter without stopcock and a preliminary note on the vapor tension of different deuterates of copper sulfate. *J. phys. radium*, 6: 439-440 (1935); *C.A.*, 30: 5463. ThPh
- (P-44) Do the different molecules of water of copper sulfate pentahydrate contain different proportions of deuterium oxide? *J. chim. phys.*, 34: 257-264 (1937); *C.A.*, 31: 6073. AnDn

PESCE, B.

See also PARRAVANO, N.

PESCE, B., and CERVONE, S.

- (P-45) The isotopic composition of atmospheric humidity. *Gazz. chim. ital.*, 70: 727-728 (1940); *C.A.*, 35: 5366. AbG

PETERS, H. C.

- (P-46) Application of general fluid-circuit theory to (absorption from intestine of) chloride, bromide and deuterium oxide.

PETERS, H. C. (Continued)

Bull. Math. Biophys., 3: 149-152 (1941); C.A., 37: 2427.
InBi

PETERS, H. C., and VISSCHER, M. B.

(P-47) Mechanism of active absorption from the intestine. J. Cellular Comp. Physiol., 13: 51-67 (1939); C.A., 33: 3440. InBi

PETERS, K., and LOHMAR, W.

(P-48) The quantitative separation of hydrogen isotopes by fractional desorption. Z. physik. Chem., A180: 51-57 (1937); C.A., 32: 20. SeAd

PHILBRICK, F. A.

(P-49) The segregation of isotopes in nature. A review. School Sci. Rev., 17: 350-357 (1936); C.A., 30: 2435. AbG, AbO

PHILIPS, N. W. F.

See STEACIE, E. W. R.

PIONTKOVSKAYA, M. A. (PJONTKOVSKAYA, PJONTKOVSKAJA, M. A.)

See KORCHAGIN, L. V.

PLACINTEANU, I. I.

(P-50) The existence of a proton with negative charge; the constitution of the nucleus of the isotope of hydrogen. Bul. soc. roumaine phys., 35: 95-102 (1933); C.A., 28: 2605. NuM

PLANTEFOL, L., and CHAMPETIER, G.

(P-51) Action of heavy water (deuterium oxide) on the germination of a pollen. Compt. rend., 200: 423-425 (1935); C.A., 29: 3361. BiB

(P-52) Action of heavy water (deuterium oxide) on living animals. Compt. rend., 200: 587-589 (1935); C.A., 29: 3361. BiZ

PLYLER, E. K.

See also WILLIAMS, D.

PLYLER, E. K., and WILLIAMS, D.

(P-53) The infrared absorption spectra of deuterioxide solutions in deuterium oxide. J. Chem. Phys., 4: 157-160 (1936); C.A., 30: 2845. SpVi

POLANYI, M.

- (P-54) The electrolytic isolation of the heavier hydrogen isotope by G. N. Lewis. *Naturwissenschaften*, 21: 316-317 (1933); C.A., 27: 4730. SeEl
- (P-55) Reaction rates of the hydrogen isotopes. *Nature*, 133: 26-27 (1934); C.A., 28: 1915. KiG
- (P-56) Heavy water in chemistry. *Nature*, 135: 19-26 (1935); C.A., 29: 1321. Ge, Ki
- (P-57) Heavy water. *J. Soc. Dyers Colourists*, 51: 90 (1935); C.A., 29: 3909. Ge
- (P-58) Adsorption and catalysis. *J. Soc. Chem. Ind. London*, 54: 123-140 (1935); C.A., 29: 4659. AdG, KiH

See also BOTTOMLEY, G. H., CAVANAGH, B.; ELEY, D. D.; GILFILLAN, E. S.; HORIUCHI, J.; HORREX, C.; KENNER, J.

POPP, L.

See CLUSIUS, K.; KRUIS, A.

POPPE, G.

- (P-59) Piezometric investigations. II. New experiments on the mutual solubility of liquids. *Bull. soc. chim. Belges*, 44: 640-657 (1935); C.A., 30: 2826. SoH

See also TIMMERMANS, J.

PORDES, F.

See REDLICH, O.

PORTER, C. W.

See YOUNG, L.

POSEY, L. R., and BARKER, E. F.

- (P-60) A comparison of certain infrared bands in C_2H_6 , C_2D_6 and C_2H_5D . *Phys. Rev.*, 61: 546 (1942); C.A., 37: 2991. SpVi

POYNTON, N. H.

See JOHNSON, C. H.

PRATT, R.

- (P-61) Growth of germ tubes of Erysiphe spores in deuterium oxide. *Am. J. Botany*, 23: 422-431 (1936); C.A., 30: 7602. BiB

PRATT, R. (Continued)

- (P-62) Deuterium and living organisms. A review. *Torrey*, 36: 133-138 (1936); C.A., 31: 1828. BiZ, InBi
- (P-63) Influence of deuterium oxide on the growth of *Chlorella vulgaris*. *Am. J. Botany*, 25: 699-701 (1938); C.A., 33: 1368. BiB
- (P-64) Growth of *Erysiphe* germ tubes in deuterium oxide after exposure to water. *Am. J. Botany*, 24: 76-82 (1937); C.A., 31: 7893. BiB

See also CURRY, J.

PRATT, R., CRAIG, F. N., and TRELEASE, S. F.

- (P-65) Influence of D₂O on photochemical and dark reaction of photosynthesis. *Science*, 85: 271-273 (1937); C.A., 31: 3964. KiP

PRATT, R., and CURRY, J.

- (P-66) Growth of roots in deuterium oxide. *Am. J. Botany*, 24: 412-416 (1937); C.A., 31: 7936. BiB

PRATT, R., and TRELEASE, S. F.

- (P-67) Influence of deuterium oxide on photosynthesis in flashing and in continuous light. *Am. J. Botany*, 25: 133-139 (1938); C.A., 32: 5870. KiP

PRICE, D.

See UREY, H. C.

PRICE, W. C.

- (P-68) The ultraviolet absorption of acetylene and ethylene. *Phys. Rev.*, 45: 843-844 (1934); C.A., 28: 4981. SpEl
- (P-69) The absorption spectra of acetylene, ethylene and ethane in the far ultraviolet. *Phys. Rev.*, 47: 444-452 (1935); C.A., 29: 3601. SpEl

PRICE, W. C., and TUTTE, W. T.

- (P-70) The absorption spectra of ethylene, deuterioethylene and some alkyl-substituted ethylenes in the vacuum ultraviolet. *Proc. Roy. Soc. London*, A174: 207-220 (1940); C.A., 34: 3173. SpEl

PRICE, W. C., and WOOD, R. W.

- (P-71) Far ultraviolet absorption spectra and ionization potentials

PRICE, W. C., and WOOD, R. W. (Continued)

of benzene and benzene-d₆. J. Chem. Phys., 3: 439-444
(1935); C.A., 29: 6503. SpEl

PRIGOGINE, I.

(P-72) The nature of H binding. Bull. soc. chim. Belges, 52: 1-6
(1943); C.A., 38: 4166. Ge

PROSOVITS, P.

(P-73) Hydrogen isotopes and deuterium oxide or heavy water.
Keemia Teated, 2: 50-60 (1935); Chem. Zentr., II: 2329
(1935); C.A., 30: 6283. Ge

PURCELL, R. H.

See ANDERSON, J. S.; EMELEUS, H. J.; NEWELL, W. C.

QUERVAIN, M. de, and ZWICKER, B.

- (Q-1) Elementary electrical regions in seignetteoelectric substances. *Helv. Phys. Acta*, 16: 216-218 (1943); *C.A.*, 38: 5444. EID

QURESHI, M.

See NEHRA, V.

RABI, I. I.

See also KELLOGG, J. M. B.

RABI, I. I., KELLOGG, J. M. B., and ZACHARIAS, J. R.

- (R-1) The magnetic moment of the deuteron. *Phys. Rev.*, 46: 163-165 (1934); *C.A.*, 28: 6629. NuMg

RABI, I. I., ZACHARIAS, J. R., RAMSEY, N. F., Jr., and KELLOGG, J. M. B.

- (R-2) Magnetic resonance experiments on H_2 and D_2 molecules. *Phys. Rev.*, 55: 595 (1939); *C.A.*, 34: 4978. NuMg

RADCHENKO, N. P.

See BRODSKII, A. I.

RAEVSKII, V. (RAJEWSKY, V.)

- (R-3) The position of the lowest energy term of the deuteron. *Physik Z. Sowjetunion*, 8: 511-515 (1935); *C.A.*, 30: 2482. NuM, NuR.

RAISIN, C. G.

See ANGUS, W. R.; INGOLD, C. K.

RAKSHIT, N.

- (R-4) Density of water from various sources and isotopic ratio in hydrogen. *J. Phys. Chem.*, 39: 303 (1935); *C.A.*, 29: 3909. AbG

RALSTON, A. W.

See KEIL, H. L.

RAMSEY, N. F., Jr.

- (R-5) Rotational magnetic moment measurements on H_2 and D_2 . *Phys. Rev.*, 55: 595 (1939); *C.A.*, 34: 4978. ElMg
- (R-6) The rotational magnetic moments of H_2 , D_2 and HD molecules. The rotational radiofrequency spectra of H_2 , D_2

RAMSEY, N. F., Jr. (Continued)

and HD in magnetic fields. *Phys. Rev.*, 58: 226-236 (1940); *C.A.*, 34: 6525. ElMg, NuMg

See also KELLOGG, J. M. B.; RABI, I. I.

RANDALL, H. M.

See also FUSON, N.

RANDALL, H. M., and BARKER, E. F.

(R-7) Infrared spectra of acetylene containing deuterium. An abstract. *Phys. Rev.*, 45: 124-125 (1934); *C.A.*, 30: 7441. SpVi

RANDALL, M., and WEBB, W. A.

(R-8) Separation processes. Separation of isotopes by fractional distillation of water. *Ind. Eng. Chem.*, 31: 227-230 (1939); *C.A.*, 33: 2381. SeDs

RANK, D. H.

(R-9) Isotope of hydrogen in the atomic spectrum. *Phys. Rev.*, 42: 446 (1932); *C.A.*, 28: 3979. SpA

(R-10) The concentration of deuterium by electrolysis. *J. Chem. Phys.*, 1: 750-751 (1933); *C.A.*, 28: 406. SeEl

See also WHITMORE, F. C.; WOOD, R. W.

RANK, D. H. and BORDNER, E. R.

(R-11) Raman spectra of some molecules of the pentatomic type. *J. Chem. Phys.*, 3: 248-251 (1935); *C.A.*, 29: 4264. SpVi

RANK, D. H., BORDNER, E. R., and LARSEN, K. D.

(R-12) The Raman spectrum of neopentyl deuteride. (2,2-dimethylpropane-1-d). An abstract. *Phys. Rev.*, 45: 566 (1934); *C.A.*, 29: 4664. SpVi

RANK, D. H., LARSEN, K. D., and BORDNER, E. R.

(R-13) The Raman spectrum of heavy water vapor. *J. Chem. Phys.*, 2: 464-467 (1934); *C.A.*, 28: 6632. SpVi

RAO, B. S. R.

See BHAGAVANTAM, S.

RAO, I. R., and KOTESWARAM, P.

(R-14) Constitution of heavy water. *Nature*, 141: 331-332 (1938); *C.A.*, 32: 3265. SpVi, ThPh

RAO, I. R., and KOTESWARAM, P. (Continued)

- (R-15) Constitution of heavy water. *Indian J. Phys.*, 12: 63-74 (1938); *C.A.*, 32: 8865. SpVi

RAO, I. R., and RAO, N. R.

- (R-16) Influence of temperature on the Raman bands of H_2O , D_2O and HDO. *Indian J. Phys.*, 18: 47-51 (1944); *C.A.*, 39: 1104. SpVi

RAO, I. R., and RAO, Y. P.

- (R-17) Equilibrium between H_2O and D_2O . *Current Sci.*, 9: 171-172 (1940); *C.A.*, 34: 5755. EqL, SpVi
- (R-18) Mutual influence of water and heavy water (as shown by Raman spectra). *Indian J. Phys.*, 14: 135-142 (1940); *C.A.*, 35: 691. SpVi

RAO, K. R.

See also SASTRY, M. G.

RAO, K. R., and SASTRY, M. G.

- (R-19) Structure of the OD bands of heavy water. *Nature*, 145: 778 (1940); *C.A.*, 34: 5347. SpEl
- (R-20) A new band λ 2963 of the OD molecule. *Current Sci., India*, 9: 225 (1940); *C.A.*, 34: 6524. SpEl

RAO, N. R.

See RAO, I. R.

RAO, Y. P.

- (R-21) The presence of the heavy isotope of hydrogen in the solar atmosphere. *Science and Culture*, 7: 616-617 (1942); *C.A.*, 37: 3331. SpA, SpEl
- (R-22) Raman frequencies of HDO. *Indian J. Phys.*, 16: 205-209 (1942); *C.A.*, 37: 4013. SpVi

See also RAO, I. R.

RAPER, H. S.

See CAVANAGH, B.; CLEMO, G. R.

RARITA, W.

See MOTZ, L.

RATNER, S.

See also RITTENBERG, D.

RATNER, S., RITTENBERG, D., and SCHOENHEIMER, R.

- (R-23) The stability of hydrogen-carbon linkages in glutamic acid.
J. Biol. Chem., 135: 357-358 (1940); C.A., 34: 6575. EqL

RATNER, S., SCHOENHEIMER, R., and RITTENBERG, D.

- (R-24) Protein metabolism. **XIII.** The metabolism and inversion of
d(+)-leucine studied with two isotopes. J. Biol. Chem.,
134: 653-663 (1940); C.A., 34: 5892. InBi

RAUX, J.

- (R-25) Heavy water. Brasserie et malterie, 24: 65-68 (1934); C.A.,
28: 5171. Bi

RAY, W. A.

See JONES, G.

REA, C. A., and YUSTER, S.

- (R-26) Effect of deuterium oxide on rat sarcoma R-39. Proc. Soc.
Exptl. Biol. Med., 31: 1058-1060 (1934); C.A., 28: 7269.
BiZ

REDLICH, O.

- (R-27) Molecular vibrations and scattered spectrum of deuterium
compounds. Z. Elektrochem., 43: 661-662 (1937); C.A.,
31: 7754. SpVi
- (R-28) Anharmonicity of CH vibrations and product rule. J. Chem.
Phys., 7: 856 (1939); C.A., 33: 8065. SpVi

See also ABEL, E.

REDLICH, O., and FRIEDMAN, I. I.

- (R-29) Raman spectrum of the deuteriohydroxylammonium ion. J.
Am. Chem. Soc., 67: 893-894 (1945); C.A., 39: 3482.
SpVi, Sy

REDLICH, O., and NIELSEN, L. E.

- (R-30) Raman spectrum and molecular vibrations HNO_3 and DNO_3 .
J. Am. Chem. Soc., 65: 654-660 (1943); C.A., 33: 4513.
ElRf, MeD, SpVi

REDLICH, O., and PORDES, F.

- (R-31) The Raman spectrum of methanol-d and chloroform-d. *Naturwissenschaften*, 22: 808 (1934); C.A., 29: 2085. SpVⁱ
- (R-32) The Raman spectra of chloroform-d and methanol-d; vibration model of the type XY_3Z . *Monatsh.*, 67: 203-212 (1936); C.A., 30: 2492. SpVi, Sy

REDLICH, O., and STRICKS, W.

- (R-33) Vibrations of benzene and Raman spectra of benzene-d and benzene-d₂. *J. Chem. Phys.*, 3: 834 (1935); C.A., 30: 681. SpVi
- (R-34) Raman spectrum of *o*-dideuteriobenzene (benzene-1,2-d₂) and N-deuteriopyrrole (pyrrole-1-d). *Monatsh.*, 68: 47-50 (1936); C.A., 30: 5886. SpVi, Sy
- (R-35) The Raman spectra and vibrations of benzene-d and benzene-1,4-d₂. *Monatsh.*, 67: 213-221 (1936); C.A., 30: 2492. SpVi, Sy
- (R-36) Raman spectrum of deuteriobromoform. *Monatsh.*, 67: 328-331 (1936); C.A., 30: 5498. SpVi, Sy
- (R-37) Raman spectra and vibrations of di- and tetradeuterio-benzene. *Monatsh.*, 68: 374-382 (1936); C.A., 31: 35. SpVi, Sy

REDLICH, O., and ZENTNER, J.

- (R-38) The heats of fusion of mixtures of heavy and ordinary water. *Monatsh.*, 68: 407-414 (1936); C.A., 31: 2081. ThPh

REINDELL, H.

See BRANDT, W.

REITZ, O.

- (R-39) Daten ueber das schwere Wasser. 18 pp., Junk., The Hague, 1935; C.A., 29: 7194. Ge
- (R-40) Alcoholic fermentation in heavy water. *Z. physik. Chem.*, A175: 257-274 (1936); C.A., 30: 2435. BiC, EqL, InKi, KiL
- (R-41) The liberation of protons and deuterons from organic molecules by the general basic catalysts studied through the bromination of nitromethane. *Z. physik. Chem.*, A176: 363-387 (1936); C.A., 30: 6631. EqL, KiL, Sy
- (R-42) The hydrolytic decomposition of monochloroacetate in light and heavy water. *Z. physik. Chem.*, A177: 85-94 (1936); C.A., 31: 933. KiL

REITZ, O. (Continued)

- (R-43) Acid catalysts in light and heavy water. *Naturwissenschaften*, 24: 814 (1936); C.A., 31: 3369. ElRo, KiL
- (R-44) The bromination of acetone in light and heavy water. A contribution to general acid catalysis. *Z. Elektrochem.*, 43: 659-661 (1937); C.A., 31: 7730. InKi, KiL
- (R-45) The general acid and base catalysis of light and heavy water. The bromination of acetone catalyzed by hydrogen ions. *Z. physik. Chem.*, A179: 119-134 (1937); C.A., 31: 7732. KiL, Sy
- (R-46) Reaction rates in heavy water. A review. *Z. Elektrochem.*, 44: 72-81 (1938); C.A., 32: 2411. KiL
- (R-47) Acid and basic hydrolysis of acetamide and acetonitrile in heavy water. *Z. Elektrochem.*, 44: 693-695 (1938); C.A., 33: 29. KiL
- (R-48) Acid and base catalysis in light and heavy water. II. Hydrolysis and deuterium exchange of acetamide and acetonitrile. *Z. physik. Chem.*, A183: 371-391 (1939); C.A., 33: 3240. EqL, KiL, MeD

See also BONHOEFFER, K. F.

REITZ, O., and BONHOEFFER, K. F.

- (R-49) The incorporation of heavy hydrogen in growing organisms. *Naturwissenschaften*, 22: 744 (1934); C.A., 29: 2183. Bi
- (R-50) The fixation of heavy hydrogen in growing organisms. *Z. physik. Chem.*, A172: 369-388 (1935); C.A., 29: 5129. BiB
- (R-51) The formation of heavy hydrogen in growing organisms. II. *Z. physik. Chem.*, A174: 424-434 (1935); C.A., 30: 1813. BiB

REITZ, O., and KOPP, J.

- (R-52) Acid- and base-catalysis in light and heavy water. III. Bromination of acetone catalyzed by undissociated acids and by acetate ions. *Z. physik. Chem.*, A184: 429-445 (1939); C.A., 34: 313. KiL

REYERSON, L. H.

- (R-53) Isotopic interchange between acetylene and heavy water. *J. Am. Chem. Soc.*, 57: 779-780 (1935); C.A., 29: 3596. EqH

REYERSON, L. H., and GILLESPIE, B.

- (R-54) Equilibrium studies on the exchange reaction between acetylene and heavy water. *J. Am. Chem. Soc.*, 57: 2250-2251 (1935); *C.A.*, 30: 1288. EqH
- (R-55) Equilibria of the reaction between acetylene and heavy water at 25°. *J. Am. Chem. Soc.*, 58: 282-284 (1936); *C.A.*, 30: 2469. EqG, EqH, EqL
- (R-56) Equilibria of the reactions between acetylene and deuterium oxide at 0° and 100° and the heats of reaction. *J. Am. Chem. Soc.*, 59: 900-902 (1937); *C.A.*, 31: 4569. EqH, ThF

REYERSON, L. H., JOHNSON, O., and BEMMELS, C.

- (R-57) A chemical separation of the isotopes of hydrogen. *J. Am. Chem. Soc.*, 61: 1594-1595 (1939); *C.A.*, 33: 6148. SeCh

REYERSON, L. H., and YUSTER, S.

- (R-58) Isotopic exchange between H_2O and C_2H_2 . *J. Am. Chem. Soc.*, 56: 1426-1427 (1934); *C.A.*, 28: 4373. EqH

RICE, L. E.

See BARBOUR, H. G.

RICE, O. K.

See SICKMAN, D. V.

RICE, W. W.

See KISTIAKOWSKY, G. B.

RICHARDS, O. W.

- (R-59) The growth of yeast in water containing deuterium. An abstract. *Am. J. Botany*, 20: 679 (1933). BiB
- (R-60) The effect of deuterium on the growth of yeast. *J. Bact.*, 28: 289-294 (1934); *C.A.*, 29: 486. BiB
- (R-61) The analysis of growth as illustrated by yeast. *Cold Spring Harbor Symposia Quant. Biol.*, 2: 157-166 (1934); *C.A.*, 29: 8057. BiB
- (R-62) Failure of paraffine to stimulate yeast growth with reference to the effect of heavy water. *Am. J. Botany*, 22: 911 (1935). BiB

RICHARDS, W. T.

- (R-63) Acoustical studies. V. The collision efficiencies of deuterium and hydrogen in exciting the lower vibrational states of ethylene. *J. Chem. Phys.*, 4: 561-566 (1936); *C.A.*, 30: 7406. MeAc

RICHARDSON, J. S., and HOOD, G. R.

- (R-64) An experiment with heavy water. *Ohio J. Sci.*, 37: 82-84 (1937); *C.A.*, 31: 6073. SeCh

RICHARDSON, O.

See DRINKWATER, J. W.

RICHTER, S.

- (R-65) Investigations on polarization of canal-ray luminosity. *Ann. Physik*, 38: 59-84 (1940); *C.A.*, 35: 971. ElGd, SpA

RIDEAL, E. K.

- (R-66) Heavy hydrogen as a research tool. *Chemistry & Industry*, 1934: 610-611; *C.A.*, 28: 5754. Ge

- (R-67) Physical and chemical properties of heavy water. A review. *Nature*, 134: 504 (1934). Ge

See also BARRER, R. M.; CRAXFORD, S. R.; ELEY, D. D.; FARKAS, A.; HUGHES, A. H.; MELVILLE, H. W.; STEINER, H.; TUCHOLSKI, T.; TWIGG, G. H.

RIDOUT, J. H.

See BARRETT, H. M.

RIESENFELD, E. H.

- (R-68) Recent research on heavy water and its occurrence in nature. *Svensk Kem. Tid.*, 49: 112-123 (1937); *C.A.*, 31: 4860. Ge

RIESENFELD, E. H., and CHANG, T. L.

- (R-69) The critical temperature of heavy water. *Z. physik. Chem.*, B28: 408-409 (1935); *C.A.*, 29: 4648. ThPh
- (R-70) The critical data of light and heavy water and the density-temperature diagram. *Z. physik. Chem.*, B30: 61-68 (1935); *C.A.*, 30: 946. ThPh
- (R-71) The enrichment of heavy-water isotopes in ordinary water through fractional crystallization. *Ber.*, 69B: 1302-1305 (1936); *C.A.*, 30: 5862. SeCr
- (R-72) The H_2O and HDO contents of rain and snow. *Ber.*, 69B: 1305-1307 (1936); *C.A.*, 30: 5843. AbG
- (R-73) The distribution of heavy-water isotopes on the earth. *Ber.*, 69B: 1308-1310 (1936); *C.A.*, 30: 5843. AbG, AbO
- (R-74) Vapor pressure and heat of vaporization of heavy water. *Z. physik. Chem.*, B33: 120-126 (1936); *C.A.*, 30: 6255. ThPh

RIESENFELD, E. H., and CHANG, T. L. (Continued)

- (R-75) Vapor pressure, boiling point and heat of vaporization of HDO and H_2O^{18} . *Z. physik. Chem.*, B33: 127-132 (1936); C.A., 30: 6255. ThPh
- (R-76) The distribution of heavy water on the earth. *Umschau*, 40: 621-623 (1936); C.A., 30: 7927. AbG
- (R-77) The influence of fluctuations in the isotopic constitution of water on fundamental units of volume and temperature. *Physik. Z.*, 37: 690-692 (1936); C.A., 31: 15. Ab
- (R-78) The distribution of the heavy hydrogen isotope on the earth. *Naturwissenschaften*, 24: 616-618 (1936); C.A., 31: 315. AbG

RIESENFELD, E. H., and RIESENFELD, H. E.

- (R-79) The heavy-water content of the water of crystallization of minerals. *Ber.*, 67B: 1659-1660 (1934); C.A., 29: 41. AbG

RIESENFELD, E. H., and TOBIANK, M.

- (R-80) Content of heavy water in the water of crystallization of minerals. II. *Ber.*, 68B: 1962-1969 (1935); C.A., 30: 412. AbG

RIESENFELD, H. E.

See RIESENFELD, E. H.

RITTENBERG, D.

See also BLOCH, K.; CLUTTON, R.; FOSTER, G. L.; HEYNINGEN, W. E. van; KESTON, A.; RATNER, S.; SCHOENHEIMER, R.; SHAPIRO, A.; UREY, H. C.; VIGNEAUD, V. du

RITTENBERG, D., BLEAKNEY, W., and UREY, H. C.

- (R-81) The equilibrium among the three hydrogens. *J. Chem. Phys.*, 2: 48-49 (1934); C.A., 28: 1922. Ab, EqG

RITTENBERG, D., KESTON, A. S., SCHOENHEIMER, R., and FOSTER, G. L.

- (R-82) Deuterium as an indicator in the study of intermediary metabolism. XIII. The stability of hydrogen in amino acids. *J. Biol. Chem.*, 125: 1-12 (1938); C.A., 32: 7984. InBi

RITTENBERG, D., RATNER, S., and HOBERMAN, H. D.

- (R-83) Catalytic hydrogenation with deuterium. *J. Am. Chem. Soc.*, 62: 2249-2250 (1940); C.A., 34: 6575. EqH

RITTENBERG, D., and SCHOENHEIMER, R.

- (R-84) Deuterium as an indicator in the study of intermediary metabolism. II. Methods. *J. Biol. Chem.*, 111: 169-174 (1935); C.A., 29: 7353. InBi
- (R-85) Deuterium as an indicator in the study of intermediary metabolism. III. The role of fat tissues. *J. Biol. Chem.*, 111: 175-178 (1935); C.A., 29: 7353. InBi
- (R-86) Deuterium as an indicator in the study of intermediary metabolism. VIII. Hydrogenation of fatty acids in the animal organism. *J. Biol. Chem.*, 117: 485-490 (1937); C.A., 31: 2239. InBi
- (R-87) Deuterium as an indicator in the study of intermediary metabolism. XI. Further studies on the biological uptake of deuterium into organic substances with special reference to fat and cholesterol formation. *J. Biol. Chem.*, 121: 235-253 (1937); C.A., 32: 200. EqL, IhBi

RITTENBERG, D., SCHOENHEIMER, R., and EVANS, E. A., Jr.

- (R-88) Deuterium as an indicator in the study of intermediary metabolism. X. The metabolism of butyric and caproic acids. *J. Biol. Chem.*, 120: 503-510 (1937); C.A., 31: 8573. InBi, Sy

RITTENBERG, D., and UREY, H. C.

- (R-89) Thermal decomposition of deuterium iodide. *J. Chem. Phys.*, 2: 106-107 (1934); C.A., 28: 2251. EqH
- (R-90) The thermal decomposition of deuterium iodide. *J. Am. Chem. Soc.*, 56: 1885-1889 (1934); C.A., 28: 6615. EqG, EqH, Sy

RIVIÈRE, R. D. de la

See DUJARRIC de la RIVIÈRE, R.

ROBERTS, E. R., EMELEUS, H. J., and BRISCOE, H. V. A.

- (R-91) Preparation and properties of ethyldideuteramine and dimethyldeuteramine. *J. Chem. Soc.*, 1939: 41-52; C.A., 33: 2484. EqQ, Sy

ROBERTS, J. E.

See MAYNEORD, W. V.

ROBERTSON, J. K.

- (R-92) Interferometer patterns of the hydrogen isotopes. *Nature*, 134: 378 (1934); C.A., 28: 7151. EIRf

ROBERTSON, J. M., and UBBELOHDE, A. R.

- (R-93) Isotope effect on hydrogen and hydroxyl bonds. *Nature*, 139: 504-505 (1937); *C.A.*, 31: 3790. Cr, ThPh
- (R-94) Structural and thermal properties associated with some hydrogen bonds in crystals. I. The isotope effect. *Proc. Roy. Soc. London*, A170: 222-240 (1939); *C.A.*, 33: 4486. Cr, Sy
- (R-95) Structural and thermal properties associated with some hydrogen bonds in crystals. II. Thermal expansion. *Proc. Roy. Soc. London*, A170: 241-251 (1939); *C.A.*, 33: 4486. MeD

ROBERTSON, R.

- (R-96) Proportion of heavy water in natural water. *Nature*, 133: 611 (1934); *C.A.*, 28: 4305. AbG

ROBINSON, C. F.

- (R-97) The fine structure of hydrogen isotopes. *Phys. Rev.*, 55: 423 (1939); *C.A.*, 34: 4978. SpA

ROBINSON, R. A.

- (R-98) Relative osmotic coefficients of sodium and potassium chloride in deuterium oxide at 25°. *Trans. Faraday Soc.*, 35: 1220-1222 (1939); *C.A.*, 34: 668. ThPh, ThSo

ROBINSON, R. A., and BELL, R. P.

- (R-99) Partial molal volume of water and deuterium oxide in dioxane solutions. *Trans. Faraday Soc.*, 33: 650-652 (1937); *C.A.*, 31: 7312. ThSo

ROBSON, A. C.

See CLEMO, C. R.

ROCHESTER, G. D.

- (R-100) The band spectra of SiH and SiD. *Z. Physik*, 101: 769-784 (1936); *C.A.*, 30: 8021. SpEl, SpVi

RODEBUSH, W. H.

See BUSWELL, A. M.; CLARK, A.

ROEGENER, H.

- (R-101) Measurement of the self diffusion of liquids. *Z. Elektrochem.*, 47: 164-167 (1941); *C.A.*, 35: 5367. MeDf

ROGINSKII, S. Z.

- (R-102) Kinetic principles of the method of isotopic indicators. I. Kinetics of exchange reactions. Bull. acad. sci. U.R.S.S., Classe sci. chim. 601-615 (1940); C.A., 35: 3150. InKi, Ki

ROLLEFSON, G. K.

- (R-103) The relative reactivities of the hydrogen isotopes with chlorine. J. Chem. Phys., 2: 144-145 (1934); C.A., 28: 2989. KiG

RONAESS, E.

- (R-104) Experiments on the electrolytic conductivity of potassium chloride in heavy water. Kgl. Norske Videnskab. Selskabs, Forh., 12: 133-136 (1939; pub. 1940); C.A., 35: 3147. EcC, MeD, MeV
- (R-105) The electrolytic conductivity of KCl in D₂O. Kgl. Norske Videnskab. Selskabs, Forh., 12: 137-140 (1939). EcC, MeV
- (R-106) The electrical conductivity of NaOD in heavy water. Nord. Kemikermoeide, Forh., 5: 188-189 (1939). Chem. Zentr. II: 2567 (1942); C.A., 38: 2255. EcC
- (R-107) Conductivity of potassium halogenates and mobility of halogenate ions in heavy water. Kgl. Norske Videnskab. Selskabs Forh., 13: 20-33 (1940); C.A., 36: 4749. EcC

See also STOKLAND, K.

ROOSTER, J. de

See TIMMERMANS, J.

ROSA, A. M.

- (R-108) The absorption spectra of some hydrated salts of dysprosium. Ann. Physik, 43: 161-181 (1943); C.A., 38: 1955. ElCl

ROSEBURY, F., and HEYNINGEN, W. E. van

- (R-109) A modified micropipet for density determinations in heavy-water analysis. Anal. Chem., 14: 363-364 (1942); C.A., 36: 3397. AnDn

ROSENBLUM, C.

- (R-110) Isotopes as indicators. A review. J. Chem. Education, 17: 567-570 (1940); C.A., 35: 1278. In

ROSENFELD, L.

See MOLLER, C.

ROSS, J. F.

(R-111) Medical progress. Isotopes in medical investigation and therapy. *New England J. Med.*, 228: 454-458, 482-486 (1943); *C.A.*, 37: 6681. InBi

ROSSINI, F. D.

See also KNOWLTON, J. W.

ROSSINI, F. D., KNOWLTON, J. W., and JOHNSTON, H. L.

(R-112) Heat and free energy of formation of deuterium oxide. (research paper No. 1287) *J. Research Natl. Bur. Standards*, 24: 369-388 (1940); *C.A.*, 34: 4654. ThF, ThPh

ROSTAND, J.

(R-113) Action of heavy water on frog sperm. An abstract. *Compt. rend. soc. biol.*, 119: 31-32 (1935); *C.A.*, 29: 5133. BiZ

ROTLAT, J.

See HERSZFINKIEL, H.

ROULSTON, K. I.

See DITCHBURN, R. W.

ROUSSELOT, L.

See SCHOENHEIMER, R.

ROUX, E.

See DUJARRIC de la RIVIÈRE, R.

ROXBURGH, H. L.

See MELVILLE, H. W.

ROYEN, P.

(R-114) News about heavy hydrogen. A review. *Umschau*, 42: 207-209 (1938); *C.A.*, 32: 5295. Ge

ROZENTAL, D.

(R-115) Stoichiometric researches. II. The variation in volume of organic substances at the melting point. *Bull. soc. chim. Belges*, 45: 585-623 (1936); *C.A.*, 31: 1686. MeD

See also TIMMERMANS, J.

RULE, C. K., and La MER, V. K.

- (R-116) Dissociation constants of deuterio acids by e.m.f. measurements. J. Am. Chem. Soc., 60: 1974-1981 (1938); C.A., 32: 7328. EcP, EqI, EqL, ThF

RUMMEL, K. W.

See BONHOEFFER, K. F.

RUSTAD, S.

See FRIVOLD, O. E.

RUSTUNG, E.

See HANSEN, K.

RUTHERFORD, E. (Lord)

- (R-117) Heavy hydrogen. Nature, 132: 955-956 (1933); C.A., 28: 4977. Ge
- (R-118) The new hydrogen. An address. Scientia Milan, 55: 341-349 (1934); C.A., 28: 4305. Ge
- (R-119) The new hydrogen. Science, 80: 21-25 (1934); C.A., 28: 5327. Ge
- (R-120) The new hydrogen. Discourse delivered at the Royal Institution. Nature, 133: 481-484 (1934). Ge
- (R-121) The new hydrogen. Abstract of an address. Engineering, 137: 464 (1934). Ge

RUTHERFORD, E., et al.

- (R-122) Discussion on heavy hydrogen. Proc. Roy. Soc. London, A144: 1-28 (1934). Ge

RYDON, H. N.

See EVANS, E. M.; IVES, D. J. G.

SACHSSE, H.

See also BARTHOLOMÉ, H.

SACHASSE, H., and BRATZLER, K.

- (S-1) A simple method for the accurate estimation of heavy hydrogen isotopes by thermal conductivity. *Z. physik. Chem.*, A171: 331-340 (1934); *C.A.*, 29: 2802. AnTh

SACK, H.

See ERRERA, J.

SAKAMOTO, Y.

- (S-2) Interchange reaction between chloroform and heavy water. *J. Chem. Soc. Japan*, 57: 1169-1174 (1936); *C.A.*, 31: 931. EqL

See also HORIUCHI, J.

SAKURAI, T.

- (S-3) Paschen-Back effect of the lines $H\alpha$ and $D\alpha$. *Science Repts. Tohoku Imp. Univ., First Ser.*, 29: 504-541 (1941); *C.A.*, 35: 6866. SpA

SALAS, E. de

See also INGOLD, C. K.; NEVELL, T. P.

SALAS, E. de, and WILSON, C. L.

- (S-4) Prototropy in relation to the exchange of hydrogen isotopes. IV. Isomerization and exchange in methyleneazomethines. *J. Chem. Soc.*, 1938: 319-321; *C.A.*, 32: 4544. KiL, Sy

SALEMI, B.

See INDOVINA, R.

SALZER, F.

See also BONHOEFFER, K. F.

SALZER, F., and BONHOEFFER, K. F.

- (S-5) The enzymic cleavage of glucosides in heavy water. *Z. physik. Chem.*, A175: 304-321 (1936); *C.A.*, 30: 2993. KiB
- (S-6) The fixation of heavy hydrogen in growing organisms. IV. *Z. physik. Chem.*, A176: 202-208 (1936); *C.A.*, 30: 7131. AbO, BiB

SANDEMAN, I.

- (S-7) The molecular spectra of the hydrogen isotopes. I. Application of the rotating vibrator model to the states of deuterium. *Proc. Roy. Soc. Edinburgh*, 59: 1-14 (1938-1939); *C.A.*, 33: 6155. SpVi
- (S-8) Molecular spectra of the hydrogen isotopes. II. Assumption of a common potential function for the isotopic states. *Proc. Roy. Soc. Edinburgh*, 59: 130-140 (1939); *C.A.*, 33: 8497. SpVi

SANDERSON, J. A.

See SILVERMAN, S.

SANDLER, L.

See FARKAS, L.

SARTORI, G.

See MAGNUS, A.

SASTRY, M. G.

- (S-9) Structure of the (3,0) band λ 2569 of the OD molecule. *Current Sci., India*, 9: 368 (1940); *C.A.*, 35: 383. SpEl
- (S-10) Isotope effect in the OH, OD bands. *Current Sci. India*, 10: 362-363 (1941); *C.A.*, 36: 1238. SpEl
- (S-11) Structure of the electronic bands of the OD molecule. II. *Indian J. Phys.*, 15: 95-102 (1941); *C.A.*, 36: 2475. SpEl
- (S-12) Structure of the electronic bands of the OD molecule. III. *Indian J. Phys.*, 15: 455-474 (1941); *C.A.*, 36: 5091. SpEl
- (S-13) Structure of the electronic bands of the OD molecule. IV. Spin doubling. *Indian J. Phys.*, 16: 27-34 (1942); *C.A.*, 36: 6901. SpEl
- (S-14) Structure of the electronic bands of the OD molecule. V. Λ Doubling. *Indian J. Phys.*, 16: 169-175 (1942); *C.A.*, 37: 1650. SpEl
- (S-15) Structure of the electronic bands of the OD molecule. VI. Isotopic shift. *Indian J. Phys.*, 16: 343-346 (1942); *C.A.*, 37: 6551. SpEl

See also RAO, K. R.

SASTRY, M. G., and RAO, K. R.

- (S-16) Structure of the electronic bands of the OD molecule. I.
Indian J. Phys., 15: 27-51 (1941); C.A., 36: 33. SpEl

SATTLER, H.

See LANGE, E.

SATUNOVSKII, Y. A.

See ZAN'KO, A. A.

SAUR, E.

- (S-17) The lattice constants of alum with heavy and light water of crystallization. Z. Krist., 97: 523-525 (1937); C.A., 32: 1997. Cr

SAVARD, J.

- (S-18) Electrolysis at constant level of a mixture of light and heavy water. J. phys. radium (8), 5: 85-89 (1944); C.A., 39: 3209. SeEl

SAWYER, W. W.

- (S-19) Note on a paper by Bell and Wolfenden on electrolytic separation of diplogen (deuterium). Proc. Cambridge Phil. Soc., 31: 116-118 (1935); C.A., 29: 2841. SpEl

SAYLOR, J. H.

See VERMILLION, H. E.

SCARRE, O. C. (SKARRE, O. K.)

See BRODSKII, A. I.

SCHACHERL, F.

- (S-20) The preparation of heavy water. Priroda, 28: 226-234 (1935). Chem. Obzor, 12, Abstracts 106; C.A., 31: 6073. Se

See also PERPEROT, H.

SCHACHERL, F., and BEHOUNEK, O.

- (S-21) Dissociation pressure of copper sulfate pentadeuteriate. Nature, 138: 406 (1936); C.A., 30: 7976. ThPh
- (S-22) Dissociation pressure of copper sulfate pentadeuteriate and trideuteriate. Collection Czechoslov. Chem. Commun., 11: 57-69 (1939); C.A., 33: 4501. ThPh

SCHAEFER, K.

- (S-23) The second virial coefficient of heavy hydrogen. *Naturwissenschaften*, 24: 539 (1936); C.A., 31: 315. MeD
- (S-24) The second virial coefficient of the different modifications of light and heavy hydrogen. I. Experimental determination. *Z. physik. Chem.*, B36: 85-104 (1937); C.A., 31: 6520. MeD
- (S-25) The second virial coefficient of the different modifications of light and heavy hydrogen. II. Theoretical calculations. *Z. physik. Chem.*, B38: 187-208 (1937); C.A., 32: 1150. MeD
- (S-26) The vapor-pressure difference and the molar heat capacity of ortho- and para-hydrogen. *Z. physik. Chem.*, B42: 380-394 (1939); C.A., 33: 4095. ThF, ThPh
- (S-27) Thermal and caloric difference effects in ortho- and para-hydrogen. Reply to a remark of Cohen and Urey on an earlier work of the author on the same subject. *Z. physik. Chem.*, B45: 451-464 (1940); C.A., 34: 7680. ThPh

See also EUCKEN, A.

SCHANZER, W.

See CLUSIUS, K.

SCHEEPERS, L.

See GOLDFINGER, P.

SCHEINBERG, H.

See EDSALL, J. T.

SCHENKEL, H.

See ERLENMEYER, H.

SCHERRER, P.

See ZWICKER, B.

SCHIFLETT, C. H.

See LIND, S. C.

SCHMID, R.

See GEROE, L.

SCHMIDT, E.

- (S-28) Heat conductivity, convection and heat transfer. *Physik regelmaess. Ber.*, 5: 101-106 (1937); C.A., 33: 1582. ThD

SCHMIDT-NIELSEN, K.

See SCHMIDT-NIELSEN, SIGVAL

SCHMIDT-NIELSEN, SIGNE, and SCHMIDT-NIELSEN, SIGVAL

- (S-29) Orienting rat-feeding experiments with deuterium oxide. Kgl. Norske Videnskab. Selskab Forh., 8: 27-28 (1935); C.A., 30: 1827. BiZ, InBi

SCHMIDT-NIELSEN, SIGVAL, and SCHMIDT-NIELSEN, K.

- (S-30) The behavior of *Drosophila* on nutrient media containing deuterium oxide. Kgl. Norske Videnskab. Selskab Forh., 9: 28-30 (1936); C.A., 31: 2691. BiZ

SCHMIDT-NIELSEN, SIGVAL

See also SCHMIDT-NIELSEN, SIGNE

SCHNEIDER, J. Z., and SLEZAK, J.

- (S-31) Heavy water in Czechoslovakian mineral waters. Chem. Obzor, 9: 160-161 (1934); C.A., 29: 4669. AbG

SCHNITGER, H.

See GUENTHERSCHULZE, A.

SCHNURMANN, R.

- (S-32) A few researches with heavy water. Z. Elektrochem., 40: 365-366 (1934); C.A., 28: 6061. MeD, SpEl

SCHOENAUER, W.

See ERLENMEYER, H.

SCHOENHEIMER, R.

- (S-33) The investigation of intermediary metabolism with the aid of heavy hydrogen. Harvey Lectures, 1936-1937: 122-144. InBi, Sy

See also ANCHEL, M.; BERNHARD, K.; CLUTTON, R. F.; FOSTER, G. L.; HEYNINGEN, W. E. van; KESTON, A. S.; RATNER, S.; RITTENBERG, D.; SHAPIRO, A.; VIGNEAUD, V. du; WEISSMAN, N.

SCHOENHEIMER, R., and EVANS, E. A., Jr.

- (S-34) The chemistry of the steroids. Ann. Rev. Biochem., 6: 139-162 (1937). InKi

SCHOENHEIMER, R., and RITTENBERG, D.

- (S-35) Deuterium as an indicator in the study of intermediary metabolism. *Science*, 82: 156-157 (1935); InBi
- (S-36) Deuterium as an indicator in the study of intermediary metabolism. I. *J. Biol. Chem.*, 111: 163-168 (1935); C.A., 29: 7352. InBi, Sy
- (S-37) Deuterium as an indicator in the study of intermediary metabolism. V. The desaturation of fat acids in the organism. *J. Biol. Chem.*, 113: 505-510 (1936); C.A., 30: 3000. InBi
- (S-38) Deuterium as an indicator in the study of intermediary metabolism. VI. Synthesis and destruction of fatty acids in the organism. *J. Biol. Chem.*, 114: 381-396 (1936); C.A., 30: 6025. InBi
- (S-39) Deuterium as an indicator in the study of intermediary metabolism. IX. The conversion of stearic acid into palmitic acid in the organism. *J. Biol. Chem.*, 120: 155-165 (1937); C. A., 31: 8572. InBi
- (S-40) Protein metabolism. I. General considerations in the application of isotopes to the study of protein metabolism. The normal abundance of nitrogen isotopes in amino acids. *J. Biol. Chem.*, 127: 285-290 (1939); C.A., 33: 1769. InBi
- (S-41) The study of intermediary metabolism of animals with the aid of isotopes. A review. *Physiol. Revs.*, 20: 218-248 (1940). InBi

SCHOENHEIMER, R., RITTENBERG, D., BERG, B. N., and ROUSSELOT, L.

- (S-42) Deuterium as an indicator in the study of intermediary metabolism. VII. Studies in the bile acid formation. *J. Biol. Chem.*, 115: 635-640 (1936); C.A., 31: 147. InBi

SCHOENHEIMER, R., RITTENBERG, D., and GRAFF, M.

- (S-43) Deuterium as an indicator in the study of intermediary metabolism. IV. The mechanism of coprosterol formation. *J. Biol. Chem.*, 111: 183-192 (1935); C.A., 29: 7353. InBi, InKi

SCHOENHEIMER, R., RITTENBERG, D., and KESTON, A. S.

- (S-44) Exchange reactions of organic compounds with sulfuric acid- d_2 . *J. Am. Chem. Soc.*, 59: 1765 (1937); C.A., 31: 7843. EqL

SCHROEER, E.

- (S-45) Decomposition of oxalic acid-d₂ in heavy water. Z. physik. Chem., A183: 392-396 (1939); C.A., 33: 3241. KiL, Sy

See also LUETGERT, I.

SCHUETZE, W.

See HARMSSEN, H.; LUKANOW, H.

SCHULZE, G.

See SIMON, A.

SCHUTZ, P. W.

See LEWIS, G. N.

SCHWARTZ, K.

- (S-46) The rate of ester hydrolysis catalyzed by hydrogen ion in heavy water. An abstract. Anz. Akad. Wiss. Wien, Math. naturw. Klasse No. 11: 115 (1934). KiL

SCHWARTZ, K., KUECHLER, L., and STEINER, H.

- (S-47) Method for obtaining deuterium oxide from water by electrolysis. Z. Elektrochem., 40: 298-299 (1934); C.A., 28: 4977. SeEl

SCHWARTZ, K., and STEINER, H.

- (S-48) The reciprocal exchange of the hydrogen atoms of water and acetone. Z. physik. Chem., B25: 153-156 (1934); C.A., 28: 4306. EqL

SCHWARZENBACH, G. (SCHWARTZENBACH, G.)

- (S-49) Dissociation constants of the heavy waters and electrolytes dissolved in them. Z. Elektrochem., 44: 46-55 (1938); C.A., 32: 2410. EqI
- (S-50) The normal potential of deuterium and the ion equilibria in mixtures of light and heavy water. Z. Elektrochem., 44: 302 (1938); C.A., 32: 6133. EcP, EqI

See also ERLLENMEYER, H.

SCHWARZENBACH, G., EPPRECHT, A., and ERLLENMEYER, H.

- (S-51) Dissociation constants in water and deuterium oxide. Meas-

SCHWARZENBACH, EPPRECHT, and ERLLENMEYER (Continued)

urements with the deuterium electrode. *Helv. Chim. Acta*, 19: 1292-1304 (1936); *C.A.*, 31: 1681. EcP, EqI

SCOTT, A. F.

(S-52) A test for heavy water in water from deep oil wells. *Science*, 79: 565 (1934); *C.A.*, 28: 5328. AbG, AnDn

SCOTT, R. B.

See also BRICKWEDDE, F. G.

SCOTT, R. B., and BRICKWEDDE, F. G.

(S-53) The vapor pressure of hydrogen deuteride. *Phys. Rev.*, 48: 483 (1935); *C.A.*, 31: 5676. ThPh

SCOTT, R. B., BRICKWEDDE, F. G., UREY, H. C., and WAHL, M. H.

(S-54) The vapor pressures and derived thermal properties of hydrogen and deuterium. *J. Chem. Phys.*, 2: 454-464 (1934); *C.A.*, 28: 6605. ThF, ThPh

(S-55) The change of the vapor pressure of the hydrogen isotopes with time. An abstract. *Phys. Rev.*, 45: 762 (1934). ThPh

SEABORG, G. T., WAHL, A. C., and KENNEDY, J. W.

(S-56) Thermal diffusion separation of radioactive and ordinary hydrogen isotopes. *J. Chem. Phys.*, 8: 639-640 (1940); *C.A.*, 34: 6522. SeDf

SEARS, W. C.

See CAMERON, D. M.

SEIJO, E.

(S-57) Heavy water. *Rev. centro estud. farm. y bioquím.*, 27: 92-107 (1937); *C.A.*, 31: 7304. Ge

SELWOOD, P. W.

(S-58) Heavy water. A review. *J. Chem. Education*, 18: 515-520 (1941); *C.A.*, 36: 303. Ge

See also TAYLOR, H. S.

SELWOOD, P. W., and FROST, A. A.

(S-59) Some properties of heavy water. *J. Am. Chem. Soc.*, 55:

SELWOOD, P. W., and FROST, A. A. (Continued)

4335-4336 (1933); C.A., 27: 5636. ElMg, ElRf, MeD, MeV, MeSt

SELWOOD, P. W., TAYLOR, H. S., LOZIER, W. W., and BLEAKNEY, W.

(S-60) Concentration of tritium. J. Am. Chem. Soc., 57: 780 (1935); C.A., 29: 3596. SeEl

SENKUS, M.

See BROWN, W. G.

SEXL, T.

(S-61) A simple method for determination of spin and statistics of the deuteron. Naturwissenschaften, 22: 205 (1934); C.A., 28: 4979. NuS, NuSt

SHAMOVSKII, L. M. (SHAMOVSKY)

See also KAPUSTINSKII, A. F.

SHAMOVSKII, L. M., and KAPUSTINSKAYA, N. F.

(S-62) Content of heavy water on the entrails of the earth at a depth of 1,300 meters. Acta Physiocochem. U.R.S.S., 7:797-798 (1937); C.A., 32: 4913. AbG

SHANE, C. D.

See also SPEDDING, F. H.

SHANE, C. D., and SPEDDING, F. H.

(S-63) The spectroscopic determination of e/m. Phys. Rev., 47: 33-37 (1935); C.A., 29: 2067. SpA

SHAPIRO, A., KOSTER, H., RITTENBERG, D., and SCHOENHEIMER, R.

(S-64) The origin of fecal fat in the absence of bile, studied with deuterium as an indicator. Am. J. Physiol., 117: 525-528 (1936); C.A., 31: 151. InBi

SHAW, R. W., and GIBBS, R. C.

(S-65) Hydrogen isotope effect in the OH bands λ 3064 and λ 3121. Phys. Rev., 45: 124 (1934); C.A., 30: 7441. SpEl

SHEARMAN, R. W.

See MILES, F. T.

SHEARMAN, R. W., and MENZIES, A. W. C.

- (S-66) The solubilities of potassium chloride in deuterium water and in ordinary water from 0° to 180°. *J. Am. Chem. Soc.*, 59: 185-186 (1937); *C.A.*, 31: 4564. SoH

SHELUD'KO, M. K.

See ALEKSANDROVICH, V. A.; BRODSKII, A. I.

SHERMAN, A.

See EYRING, H.; JONES, T.

SHERSHEVER, Z. M. (J. M.)

See also SLUTSKAYA, M. M.

SHERSHEVER, Z. M., BRODSKII, A. I., and SLUCKAYA, M. M.

- (S-67) Exchange reactions of hydrogen with deuterium. II. Exchange in sulfuric acid and sodium hydroxide. *Acta Physicochim. U.R.S.S.*, 2: 611-614 (1935); *C.A.*, 29: 6821. EqL

SHIBATA, K., and WATANABE, A.

- (S-68) Cell respiration and carbon dioxide assimilation in heavy water. *Acta Phytochim. Japan*, 9: 107-114 (1936); *C.A.*, 30: 8272. BiZ

SHIDEI, T.

- (S-69) Infrared absorption spectrum of heavy water. *Proc. Phys. Math. Soc. Japan*, 16: 362-364 (1934); *C.A.*, 29: 1009. SpVi
- (S-70) The band spectra of carbon deuteride. *Japan. J. Phys.*, 11: 23-34 (1936); *C.A.*, 30: 7452. SpEl

SHIMASAKI, S.

- (S-71) Constitution of atomic nuclei and their magnetic moments. *Proc. Phys. Math. Soc. Japan*, 17: 177-188 (1935); *C.A.*, 29: 6135. NuMg, NuR

SHINDO, M.

See OKAMOTO, G.

SHOUP, C. S., and MEYER, S. L.

- (S-72) The action of deuterium oxide in low concentrations on the course of gas production by brewers' yeast. *J. Tenn. Acad. Sci.*, 10: 127-130 (1935); *C.A.*, 29: 8225. BiB

- SIBATA, Y. (SHIBATA, Y.), NOGUTI, K., and KANEKO, O.
(S-73) Geochemical investigations of volcanoes in Japan. IX. Investigation of the concentration of D_2O in the spring waters in the vicinity of volcano Asama. I. Bull. Chem. Soc. Japan, 14: 274-279 (1939); C.A., 33: 7246. AbG
- SIBATA, Z., and KUZIRAI, M.
(S-74) Measurement of the equilibrium reaction $H_2O + D_2 = D_2O + H_2$. J. Chem. Soc. Japan, 61: 1199-1206 (1940); C.A., 35: 1296. EqH
- SIBUYA, T.
See TAKEUTI, T.
- SICKMAN, D. V.
See also ZANETTI, J. E.
- SICKMAN, D. V., and RICE, O. K.
(S-75) The decomposition of azomethane. III. Effect of various inert gases. J. Chem. Phys., 4: 608-613 (1936); C.A., 30: 7016. KiG
- SIDGWICK, N. V.
(S-76) Designation of heavy hydrogen. Nature, 133: 529-530 (1934). No
- SIEVERTS, A., and DANZ, W.
(S-77) The solubility of deuterium and hydrogen in solid palladium. II. Z. physik. Chem., B34: 158-159 (1936); C.A., 31: 591. EcC, SoG
(S-78) The solubility of deuterium and hydrogen in solid palladium. III. Z. physik. Chem., B38: 46-60 (1937); C.A., 32: 855. SeAd, SoG
(S-79) The electrical resistance and magnetic susceptibility of palladium wire charged with deuterium. Z. physik. Chem., B38: 61-71 (1937); C.A., 32: 850. EcC, ElMg
(S-80) The solubility of deuterium in solid nickel. Z. anorg. Chem., 247: 131-134 (1941); C.A., 39: 4537. SoG
- SIEVERTS, A., and MORITZ, H.
(S-81) Columbium and hydrogen, columbium and deuterium. Z. anorg. Chem., 247: 124-130 (1941); C.A., 36: 6071. SoG

SIEVERTS, A., and ZAPF, G.

- (S-82) The solubility of deuterium and hydrogen in solid palladium. Z. physik. Chem., A174: 359-364 (1935); C.A., 30: 1278. SoG

SIEVERTS, A., ZAPF, G., and MORTIZ, H.

- (S-83) Solubility of hydrogen, deuterium and nitrogen in iron. Z. physik. Chem., A183: 19-37 (1938); C.A., 33: 448. SoG

SILVERMAN, S., and SANDERSON, J. A.

- (S-84) The infrared spectrum of heavy ammonia. Phys. Rev., 44: 1032 (1933); C.A., 28: 1272. SpVi

SIMAZAKI, E.

See NIWA, K.

SIMEK, B. G., and STADLER, A.

- (S-85) Amount of deuterium in coal. Zprávy Ústavu Vedecký Výskum Uhlí Praze, 2: 48-52 (1935); C.A., 30: 6165. AbG

SIMMONDS, S., COHN, M., CHANDLER, J. P.; and VIGNEAUD, V. du

- (S-86) The utilization of the methyl groups of chlorine in the biological synthesis of methionine. J. Biol. Chem., 149: 519-525 (1943); C.A., 38: 404. InBi

SIMON, A., and SCHULZE, G.

- (S-87) Raman spectroscopic investigations. XV. Constitution of orthophosphoric acid and its salts. Z. anorg. Chem., 242: 313-368 (1939); C.A., 34: 1563. SpVi, Sy

SIMON, F.

See MEGAW, H. D.

SIMPSON, O. C.

See ESTERMANN, I.

SKARRE, O. K. (SCARRE, O. C.)

See BRODSKII, A. I.

SKJULSTAD, T.

See FRIVOLD, O. E.

SKLAR, A. L.

See SPONER, H.

SKRINNIKOVA, N. P. (SKRINNIKOWA)

See BRODSKII, A. I.

SLACK, C. M., and EHRKE, L. F.

(S-88) Simple equipment for electrolyzing heavy water. *Rev. Sci. Instruments*, 8: 39 (1937); *C.A.*, 31: 1706. SeEl

SLACK, F. G.

(S-89) The Verdet constant of heavy water. *Phys. Rev.*, 46: 945-947 (1934); *C.A.*, 29: 999. ElMr

SLAWSKY, Z. I., and DENNISON, D. M.

(S-90) The centrifugal distortion of axial molecules. *J. Chem. Phys.*, 7: 509-521 (1939); *C.A.*, 33: 6669. SpVi

SLEATOR, W. W.

See also BARKER, E. F.

SLEATOR, W. W., and BARKER, E. F.

(S-91) Infrared absorption bands of heavy-water vapor. *Phys. Rev.*, 45: 336-337 (1934); *C.A.*, 30: 7443. SpVi

SLEPIAN, J.

See PATENTS, U.S.

SLEZAK, J.

See SCHNEIDER, J.

SLUTSKAYA, M. M. (SLUCKAYA; SLUCKAJA; SLUCKAIA)

See also BRODSKII, A. I.; FILIPOVA, N. S.; SHERSHEVER, Z. M.

SLUTSKAYA, M. M., SHERSHEVER, Z. M., and BRODSKII, A. I.

(S-92) Hydrogen-deuterium exchange reaction. III. Exchange in amino groups. *J. Phys. Chem. U.S.S.R.*, 9: 417-420 (1937); *C.A.*, 31: 6536. EqL

(S-93) Exchange reaction of hydrogen with deuterium. III. Exchange in amino groups. *Acta Physicochim. U.R.S.S.*, 6: 441-446 (1937); *C.A.*, 32: 4056. EqL

SMALL, P. A.

- (S-94) The equilibrium between hydrogen sulfide and heavy water. Trans. Faraday Soc., 33: 820-823 (1937); C.A., 31: 6536. EqH

SMALL, P. A., and WOLFENDEN, J. H.

- (S-95) Structure of the formate ion. Nature, 137: 781 (1936); C.A., 30: 5101. EqL, InSt
- (S-96) Exchange reactions of heavy water with organic compounds. I. Phenol, acetanilide, and the formate ion. J. Chem. Soc., 1936: 1811-1817; C.A., 31: 5659. EqL

SMITH, E. A., and TAYLOR, H. S.

- (S-97) The interaction of hydrogen and deuterium on zinc oxide. J. Am. Chem. Soc., 60: 362-371 (1938); C.A., 32: 2815. AdG, AnTh, KiH

SMITH, E. R.

- (S-98) The isotopic fractionation of water by physiological processes—an addition. Science, 79: 454-455 (1934); C.A., 28: 4442. AbO

See also WASHBURN, E. W.

SMITH, E. R., and WOJCIECHOWSKI, M.

- (S-99) Boiling point—composition diagram for dilute aqueous solutions of deuterium oxide. (research paper No. 947). J. Research Natl. Bur. Standards, 17: 841-848 (1936); C.A., 31: 2076. ThPh

SMITH, F. A.

See WASHBURN, E. W.

SMITH, J. O., Jr., and TAYLOR, H. S.

- (S-100) The reactions of methyl-radicals with deuterium, ethane, neopentane, butane, and isobutane. J. Chem. Phys., 7: 390-396 (1939); C.A., 33: 5743. KiP

SMITH, L. G., and WILLIAMS, V.

- (S-101) Rotational structure of some fundamental infrared bands of deuterated formic acid. Phys. Rev., 58: 208 (1940); C.A., 36: 3430. SpVi

SMITH, P. K., and BARBOUR, H. G.

- (S-102) The fixation of deuterium in mice. An abstract. *J. Pharmacol. Exptl. Therap.*, 57: 143 (1936). BiZ

SMITH, P. K., TRACE, J., and BARBOUR, H. C.

- (S-103) The fate of deuterium in the mammalian body. *J. Biol. Chem.*, 116: 371-376 (1936); *C.A.*, 31: 744. InBi

SMITH, P. T.

See LOZIER, W. W.; TATE, J. T.

SMITH, R. A.

- (S-104) Application of wave mechanics to reactions involving hydrogen and diplogen (deuterium). *Proc. Cambridge Phil. Soc.*, 30: 508-513 (1934); *C.A.*, 29: 993. KiG

SMITH, R. E.

- (S-105) Decomposition of acetaldehyde and deuterioacetaldehyde. *Trans. Faraday Soc.*, 35: 1328-1336 (1939); *C.A.*, 34: 930. KiL

SMITH, T.

See HALL, N. F.

SMITS, A., and MEERMAN, P. G.

- (S-106) Retrograde transformation of ammonium-d₄ bromide. II. *Z. physik. Chem.*, B49: 13-20 (1941). *Science Abstracts*, 44A: 361 (1941); *C.A.*, 36: 4385. ThPh

SMITS, A., and MULLER, G. J.

- (S-107) The low-temperature transformation of heavy ammonium chloride. *Nature*, 139: 804 (1937); *C.A.*, 31: 5252. MeD, Sy, ThPh

SMITS, A., MULLER, G. J., and KROEGER, F. A.

- (S-108) The low-temperature transition of ammonium-d₄ chloride. *Z. physik. Chem.*, B38: 177-186 (1937); *C.A.*, 32: 1171. MeD, Sy, ThPh

SMITS, A., TOLLENAAR, D., and KROEGER, F. A.

- (S-109) Nature of the low temperature transformation of ND₄Br. I. A retrograde transformation. *Z. physik. Chem.*, B41: 215-233 (1938); *C.A.*, 33: 458. Sy, ThPh

SMOLENSKAYA, B. L.

See BRODSKII, A. I.

SMYTH, C. P.

See BRUYNE, J. M. A. de

SMYTH, H. D.

See HARNWELL, G. P.

SMYTHE, W. R.

See WOOLDRIDGE, D. E.

SNELL, A. H.

See FOSTER, J. S.

SNOW, R. D., and JOHNSTON, H. L.

(S-110) Deuterium content of natural butane. *Science*, 80: 210-211 (1934); *C.A.*, 28: 7152. AbG

SOARES, M.

See JACOBSON, K. P.

SOHM, M.

(S-111) Absorption of liquid H_2O and D_2O in the infrared spectral range between 5μ and 27μ . *Z. Physik*, 116: 34-46 (1940); *C.A.*, 35: 2791. SpVi

SOLLER, T., GOLDWASSER, S., and BEEBE, R. A.

(S-112) A sensitive menostat for low pressures and its application to the adsorption of hydrogen and deuterium on copper. *J. Am. Chem. Soc.*, 58: 1703-1706 (1936); *C.A.*, 30: 7394. AdG

SOLLERS, E. F., and CRENSHAW, J. L.

(S-113) The dissociation pressures of potassium deuteride and potassium hydride. *J. Am. Chem. Soc.*, 59: 2015-2022 (1937); *C.A.*, 31: 8285. SeCh, Sy, ThD, ThPh

(S-114) The dissociation pressures of sodium deuteride and sodium hydride. *J. Am. Chem. Soc.*, 59: 2724-2726 (1937); *C.A.*, 32: 1549. Sy, ThF, ThPh

SOLOMON, J.

(S-115) Theory of the deuteron. *Compt. rend.*, 210: 477-478 (1940); *C.A.*, 34: 3579. NuM

SOLOV'EV, V. E. (SOLOVIEFF, V. E.)

See LANDSBERG, G. S.

SONDERHOFF, R.

See FROMHERZ, H.

SONDERHOFF, R., and THOMAS, H.

(S-116) Enzymic dehydrogenation of trideuteroacetic acid. *Naturwissenschaften*, 24: 570 (1936); C.A., 31: 422. InBi

(S-117) Enzymic dehydrogenation of trideuteroacetic acid. *Ann.*, 530: 195-213 (1937); C.A., 32: 1731. KiB

SORGE, B. W.

See ELLIS, J. W.

SOUZA-REIS, F. de, and MOGGI, S.

(S-118) Isotopes. A review. *Rev. quím. e farm. Rio de Janeiro*, 3: 34-40 (1938); C.A., 32: 5673. Ge

SPAEPEN, J.

See ITTERBEEK, A. van

SPECCHIA, O., and DALLAPORTA, N.

(S-119) Heavy hydrogen. A review. *Elettrotecnica (N.S.)*, 22: 122-127 (1935). Sp

SPECCHIA, O., and DASCOLA, G.

(S-120) Diamagnetism of heavy water. *Nuovo cimento*. 12: 606-609 (1935); C.A., 30: 2061. ElMg, MeD

SPEDDING, F. H.

See also LEWIS, G. N.; SHANE, C. D.

SPEDDING, F. H., SHANE, C. D., and GRACE, N. S.

(S-121) Fine structure of H^2 alpha. *Phys. Rev.*, 44: 58 (1933); C.A., 27: 4166. SpA

SPENCER, J. F.

See TREW, V. C. G.

SPERRY, W. M.

See also WAELSCH, H.

SPERRY, W. M., WAELSCH, H., and STOYANOFF, V. A.

- (S-122) Lipide metabolism in brain and other tissues of the rat. J. Biol. Chem., 135: 281-290 (1940); C.A., 34: 6683. InBi

SPINKS, J. W. T.

See HERZBERG, G.

SPONER, H.

- (S-123) Absorption spectrum of heavy benzene at 2730-2250 Å. An abstract. Phys. Rev., 55: 683 (1939); C.A., 34: 4979. SpVi

- (S-124) The near ultraviolet absorption spectrum of heavy benzene. J. Chem. Phys. 8: 705-710 (1940); C.A., 34: 7178. SpEl

See also BECK, C. A.

SPONER, H., NORDHEIM, G., SKLAR, A. L., and TELLER, E.

- (S-125) Analysis of the near-ultraviolet electronic transition of benzene. J. Chem. Phys., 7: 207-220 (1939); C.A., 33: 4127. SpEl, SpFl

SPOOR, N. L.

See ANDERSON, J. S.

SPROWLS, W. R.

See BROWN, W. G.

SQUIRE, C. F.

See MURRAY, J. W.

STADLER, A.

See SIMEK, B. G.

STAIR, R.

See COBLENTZ, W. W.

STAMM, H., and GOEHRING, M.

- (S-126) Kinetics of the cleavage of dithionic acid. II. Comparison of the velocities of decomposition in D₂O and H₂O. Z. physik. Chem., A183: 112-120 (1938); C.A., 33: 1578. KiL

STANFORD, S. C.

See GORDY, W.

STARONKA, L.

- (S-127) Possibility of supercooling heavy water and its mixtures with ordinary water. *Roczniki Chem.*, 19: 317-322 (1939); *C.A.*, 34: 3147. KiH, ThPh

STEACIE, E. W. R.

- (S-128) The enzymic inversion of cane sugar in heavy water. *Z. physik. Chem.*, B27: 6-10 (1934); *C.A.*, 29: 826. KiB
- (S-129) The enzymic splitting of salicin by emulsin in heavy water. *Z. physik. Chem.*, B28: 236-238 (1935); *C.A.*, 29: 3697. KiB
- (S-130) The reaction of deuterium atoms with methane at high temperatures. *Can. J. Research*, 15B: 264-277 (1937); *C.A.*, 31: 6536. KiG
- (S-131) The kinetics of the reaction $H + C_2H_6 = CH_4 + CH_3$. *J. Chem. Phys.*, 6: 37-40 (1938); *C.A.*, 32: 1551- KiG

See also GEIB, K. H.

STEACIE, E. W. R., and ALEXANDER, W. A.

- (S-132) The use of deuterio compounds as indicators for the presence of free radicals in organic decomposition reactions. *J. Chem. Phys.*, 5: 372 (1937); *C.A.*, 31: 4571. InSt
- (S-133) Free radicals in organic decomposition reactions. I. The thermal decomposition of mixtures of methyl ether and deuterioacetone (acetone- d_6). *Can. J. Research*, 15B: 295-304 (1937); *C.A.*, 31: 8508. InKi

STEACIE, W. R., ALEXANDER, W. A., and PHILIPS, N. W. F.

- (S-134) The mercury-photosensitized decomposition of ethane. III. The reaction in the presence of added deuterium. *Can. J. Research*, 16B: 314-318 (1938); *C.A.*, 33: 483. EqG, InKi, KiP

STEACIE, E. W. R., and PARLEE, N. A. D.

- (S-135) The reaction of hydrogen and deuterium atoms with propane. *Can. J. Research*, 17B: 371-384 (1939); *C.A.*, 34: 1233. InKi

STEACIE, E. W. R., and PHILLIPS, N. W. F.

- (S-136) Reactions of deuterium atoms with methane and ethane. *J. Chem. Phys.*, 4: 461-468 (1936); *C.A.*, 30: 6648. EqG, KiG, KiP

STEDMAN, D. F.

- (S-137) Preliminary study of the fractionation of isotopic isomers by distillation. *Can. J. Research*, 13B: 114-121 (1935); C.A., 30: 337. Sy, ThPh

STEENBECK, M.

- (S-138) The field strength in the column of discharges in light and heavy hydrogen. *Physik. Z.*, 37: 823-824 (1936). Z. tech. Physik, 17: 397-398 (1936); C.A., 31: 940. ElGd

STEHN, J. R.

See BREIT, G.

STEINER, H.

See also FINK, A.; GROSS, P.; SCHWARZ, K.

STEINER, H., and RIDEAL, E. K.

- (S-139) Exchange reactions between deuterium and hydrogen halides. I. Hydrogen chloride. *Proc. Roy. Soc. London*, A173: 503-530 (1939); C.A., 34: 3159. EqG, KiG, Sy

STEINER, K.

- (S-140) The change, with time, of the vapor pressure of mixtures of the hydrogen isotopes at 20.38° absolute. *Physik. Z.*, 36: 659-660 (1935); C.A., 30: 365. ThPh

See also MEISSNER, W.

STEINERT, B.

- (S-141) Heavy water. A review. *Wallerstein Labs. Commun.* 2: 21-24 (1939); C.A., 33: 9536. Bi, Ge

STEINKOPF, W., and BOETIUS, M.

- (S-142) Thiophene series. LX. Deuteriothiophene. *Ann.*, 546: 208-210 (1941); C.A., 35: 3632. ElRf, MeD, Sy, ThPh

STEKOL, J. A., and HAMILL, W. H.

- (S-143) The nonlabile deuterium of amino acids subjected to treatment in the medium of dilute deuterium oxide. *J. Biol. Chem.*, 120: 531-536 (1937); C.A., 31: 8559. EqL

STERCKX, R.

- (S-144) Some new methods of investigation applied in biological sciences. *Ann. zymol.*, 6: 337-354 (1939); C.A., 34: 2008. InBi

STERN, K., and DANCEY, T. E.

- (S-145) Injection of heavy water into the cerebrospinal fluid space. Proc. Soc. Exptl. Biol. Med., 48: 619-620 (1941); C.A., 36: 1387. BiZ

STEUBING, A., KEIL, A., and STOLPE, F.

- (S-146) Comparative measurements on the Stark effect of deuterium and hydrogen. Z. Physik, 112: 560-568 (1939); C.A., 33: 8496. SpA

STEVENS, W. H., Jr.

See BINGHAM, E. C.

STEWART, G. W.

- (S-147) Comparison of the x-ray diffraction curves of water and deuterium oxide at 25°. J. Chem. Phys., 2: 558-559 (1934); C.A., 28: 6628. CrX

STEWART, W. W., and HOLCOMB, R.

- (S-148) Biological separation of heavy water. J. Am. Chem. Soc., 56: 1422-1423 (1934); C.A., 28: 4759. AbO

STITT, F.

- (S-149) Infrared and Raman spectra of polyatomic molecules. VII. C_2D_6 . J. Chem. Phys., 7: 297-307 (1939); C.A., 33: 5290. SpVi
- (S-150) Infrared and Raman spectra of polyatomic molecules. X. C_2D_2 , C_2DH and C_2H_2 . J. Chem. Phys., 8: 56-59 (1940); C.A., 34: 1561. SpVi, Sy

See also KISTIAKOWSKY, G. B.

STOECKL, K.

- (S-151) Heavy hydrogen-heavy water. A review. Med. Klin., 32: 1105-1109 (1936); C.A., 30: 7398. Ge

STOKLAND, K.

- (S-152) Properties of heavy water. Kgl. Norske Videnskab. Selskabs, Forh., 10, No. 39: 145-148 (1937; pub. 1938); C.A., 32: 6121. ElRf, ThPh
- (S-153) Vapor pressure of the mono- and disilicanes with light and heavy hydrogen—preliminary communication. Kgl. Norske Videnskab. Selskabs, Forh., 12: 122-125 (1939); C.A., 35: 2380. ThPh

STOKLAND, K. (Continued)

- (S-154) Vapor pressure of liquid protium and deuterium compounds. Kgl. Norske Videnskab. Selskabs, Forh., 12: 126-128 (1939); C.A., 35: 2380. ThPh
- (S-155) Comparison of the vapor-pressure curves for normal H and D compounds. Nord. Kemikermode, Forh., 5: 204-205 (1939). Chem. Zentr., II: 2673 (1942); C.A., 38: 3176. ThPh

See also TRONSTAD, L.

STOKLAND, K., RONAESS, E., and TRONSTAD, L.

- (S-156) Dilation of heavy water. Trans. Faraday Soc., 35: 312-318 (1939); C.A., 33: 3224. MeD

STOLPE, F.

See STEUBING, A.

STORCH, H. H.

See also KASSEL, L. S.

STORCH, H. H., and MONTGOMERY, C. W.

- (S-157) Equation for hydrogen-oxygen explosion limits. J. Am. Chem. Soc., 56: 2644-2646 (1934); C.A., 29: 985. KiG, ThF

STOVES, J. L.

See CLARK, C. H. D.

STOYANOFF, V. A.

See SPERRY, W. M.; WAELSCH, H.

STRACHAN, C.

- (S-158) Interaction of atoms and molecules with solid surfaces. II. Evaporation of adsorbed atoms. Proc. Roy. Soc. London, A150: 456-464 (1935); C.A., 29: 5709. AdG
- (S-159) Interaction of atoms and molecules with solid surfaces. IX. The emission and absorption of energy by a solid. Proc. Roy. Soc. London, A153: 591-605 (1937); C.A., 31: 3351. AdG

See also LENNARD-JONES, J. E.

STRADA, M.

See BRUNI, G.

STRALEY, J. M.

- (S-160) The relative aromaticity of furan. Heavy hydrogen in some naturally occurring organic compounds and mixtures. Iowa State Coll. J. Sci., 11: 115-117 (1936); C.A., 31: 1397. AbO

See also KEIL, H. L.

STRATTON, K.

See PARTINGTON, J. R.

STRICKS, W.

See ABEL, E.; REDLICH, O.

STUMPER, R.

- (S-161) The concentration of heavy water in a steam boiler. Wasser, Vom. 10: 207-208 (1935); C.A., 31: 8276. SeDs

SUELLMANN, H.

See ERLENMEYER, H.

SUENAGA, K.

See NITTA, I.

SUESS, H.

- (S-162) Reactions in heavy water. A review. Wien. Chem. Ztg., 40: 239-243 (1937); C.A., 31: 6088. Eq, Ge, Ki

See also GROSS, P.

SUGDEN, S.

See GROVES, L. G.

SUGITA, T.

See TAKEUCHI, T.

SUGIURA, K., and CHESLEY, L. C.

- (S-163) Effect of heavy water (deuterium oxide) on viability of mouse sarcoma and rat carcinoma. Proc. Soc. Exptl. Biol. Med., 31: 1108-1111 (1934); C.A., 28: 7269. BiZ

SUGIURA, S.

See MIZUSIMA, S.

SUPPE, F.

- (S-164) Extinction and depolarization of mercury fluorescence by hydrogen and deuterium. Z. Physik, 113: 141-149 (1939); C.A., 33: 8501. MeDf

SUTHERLAND, G. B. B. M.

- (S-165) Vibration spectra and force constants of heavy acetylene. *Nature*, 134: 775-776 (1934); *C.A.*, 29: 1010. SpVi

See also CONN, G. K. T.

SUTHERLAND, G. B. B. M., and CONN, G. K. T.

- (S-166) Infrared absorption spectrum of heavy phosphine (PD_3). *Nature*, 138: 641-642 (1936); *C.A.*, 30: 8012. SpVi
- (S-167) Infrared spectrum of tetradeuterioethylene (ethylene- d_4). *Nature*, 140: 644-645 (1937); *C.A.*, 31: 8375. SpVi

SVEDBERG, T., and ERIKSSON-QUENSEL, I. B.

- (S-168) Hemocyanin in heavy water. *Nature*, 137: 400-401 (1936); *C.A.*, 30: 3844. KiL, MeDf

SWAN, G. A.

See CLEMO, G. R.

SWARTOUT, J. A., and DOLE, M.

- (S-169) The protium-deuterium ratio and the atomic weight of hydrogen. *J. Am. Chem. Soc.*, 61: 2025-2029 (1939); *C.A.*, 33: 8063. Ab

SWIFT, E., Jr.

- (S-170) The densities of D_2O - H_2O mixtures at 5° and 25° . *J. Am. Chem. Soc.*, 61: 198-200 (1939); *C.A.*, 33: 2383. MeD
- (S-171) Temperature of maximum density of D_2O and its mixtures with H_2O . *J. Am. Chem. Soc.*, 61: 1293-1294 (1939); *C.A.*, 33: 5250. MeD

SWINGLE, W. W.

See TAYLOR, H. S.

SWISHER, R. D.

See HALFORD, J. O.

SZABO, A. L.

See HORIUCHI, J.

SZEGO, P.

See KENNER, J.

SZULC, M.

See MROZOWSKI, S.

TA, Y.

See CHAMPETIER, G.

TAKEUTI, T. (TAKEUCHI)

- (T-1) Dielectric constant of heavy water. *Rev. Phys. Chem. Japan*, 13: 49 (1938). *Bull. Tokyo Univ. Eng.*, 7: 419 (1938); *C.A.*, 34: 7675. *EID*, *MeSt*, *So*

TAKEUTI, T., and INAI, T.

- (T-2) Specific volumes of heavy water and its ice at the freezing point. *Japan. J. Phys.*, 11: 67-68 (1936); *C.A.*, 31: 3367. *MeD*

TAKEUTI, T., and SIBUYA, T.

- (T-3) Affinity of heavy water for living tissues. *Bull. Tokyo Univ. Eng.*, 9: 246-249 (1940). *Chem. Zentr.*, II: 2638 (1940); *C.A.*, 36: 5837. *Bi*

TAKEUTI, T., SUGITA, T., and INAI, T.

- (T-4) Surface tension of heavy water. *Proc. Phys. Math. Soc. Japan*, 19: 552-554 (1937); *C.A.*, 31: 6523. *MeSt*

TAMM, G.

See BERNAL, J. D.

TAMMANN, G., and BANDEL, G.

- (T-5) The melting and transformation curves of the kinds of ice from heavy water. *Nachr. Ges. Wiss. Goettingen. Math. physik. Klasse, Fachgruppe III.*, 1, No. 3: 23-28 (1934); *C.A.*, 29: 41. *ThPh*
- (T-6) Melting and transformation curves of the kinds of ice from heavy water. *Z. anorg. Chem.*, 221: 391-396 (1935); *C.A.*, 29: 2040. *ThPh*

TAMMANN, G., and BUECHNER, A.

- (T-7) The linear speed of crystallization of ice from ordinary and heavy water. *Z. anorg. Chem.*, 222: 12-16 (1935); *C.A.*, 29: 3581. *ThPh*

TANAKA, Y.

See FUJIOKA, Y.

TANNAGER, A.

- (T-8) On the existence of dienols. Avhandl. Norske Videnskaps-Akad. Oslo, II. Mat. Naturv. Klasse, No. 9: 1-19(1939, pub. 1940). Chem. Zentr., II: 187 (1940); C.A., 36: 5462. InSt
- (T-9) Reaction mechanism for exchange reactions in liquid H₂S. Determining the combining power of H. Tids. Kjemi, Bergvesen Met., 3: 44-48 (1943); C.A., 39: 2438. EqL, InKi

TAPADINHAS, J.

See JACOBSON, K. B.; PEREIRA-FORJAZ, A. de

TARBELL, D. S.

See ADAMS, R.

TATE, T., and SMITH, P. T.

- (T-10) Attempts to observe a helium isotope. Phys. Rev., 43: 672 (1933); C.A., 27: 3137. AnMs

TAYLOR, G. W.

See also HARVEY, E. N.

TAYLOR, G. W., and HARVEY, E. N.

- (T-11) Respiration of yeast in water containing deuterium oxide. Proc. Soc. Exptl. Biol. Med., 31: 954-957 (1934); C.A., 28: 7269. BiB

TAYLOR, H. S.

- (T-12) Research on heavy hydrogen at Princeton. Science, 79: 303-305 (1934); C.A., 28: 2989. AbG, Bi, EqL, MeD
- (T-13) Heavy hydrogen—a new research tool. J. Franklin Inst., 218: 1-27 (1934); C.A., 28: 6061. Ge
- (T-14) Protium-deuterium-tritium, the hydrogen trio. A review. Sci. Monthly, 39: 364-372 (1934); C.A., 28: 6626. Ge
- (T-15) Transition point of sodium sulfate decadeuterate (decahydrate-d₂₀). J. Am. Chem. Soc., 56: 2643 (1934); C.A., 29: 1703. ThPh
- (T-16) Deuterium in research on catalysis and photochemistry. A review. J. chim. phys., 34: 529-535 (1937); C.A., 32: 403. InKi

TAYLOR, H. S. (Continued)

- (T-17) Applications of isotopes in catalytic reactions at surfaces. *Frontiers in Chemistry*, 3: 19-42 (1945); C.A., 39: 4281. Ge

See also BENEDICT, W. S.; BLACK, J. F.; BOWMAN, P. L.; BRICKWEDDE, F. G.; EVANS, M. G.; GOULD, A. J.; JORIS, G. G.; JUNGERS, J. C.; MORIKAWA, K.; PACE, J.; SELWOOD, P. W.; SMITH, E. A.; SMITH, J. O., Jr.; TRENNER, N. R.

TAYLOR, H. S., CALEY, E. R., and EYRING, H.

- (T-18) Solubility of salts in $\text{H}^2\text{H}^2\text{O}$. *J. Am. Chem. Soc.*, 55: 4334-4335 (1933); C.A., 27: 5636. SoH

TAYLOR, H. S., and DIAMOND, H.

- (T-19) Exchange reaction between deuterium and water vapor on surfaces. *J. Am. Chem. Soc.*, 56: 1821-1822 (1934); C.A., 28: 5745. EqH
- (T-20) Catalytic exchange reaction between deuterium and water. *J. Am. Chem. Soc.*, 57: 1256-1259 (1935); C.A., 29: 6130. AdG, EqH, KiH

TAYLOR, H. S., and EYRING, H.

- (T-21) Theoretical and practical studies of atomic and molecular forms of the hydrogen isotopes. *Proc. Am. Phil. Soc.*, 72: 255-264 (1933); C.A., 28: 706. NuS, NuSt, SeEl

TAYLOR, H. S., EYRING, H., and FROST, A. A.

- (T-22) Technic for the electrolytic production of $\text{H}^2\text{H}^2\text{O}$. *J. Chem. Phys.*, 1: 823-824 (1933); C.A., 28: 967. SeEl

TAYLOR, H. S., GOULD, A. J., and BLEAKNEY, W.

- (T-23) The separation of hydrogen isotopes by fractional desorption. *Phys. Rev.*, 43: 496-497 (1933); C.A., 27: 2876. SeAd

TAYLOR, H. S., and JUNGERS, J. C.

- (T-24) The deuterioammonias. *J. Am. Chem. Soc.*, 55: 5057-5058 (1933); C.A., 28: 698. MeD, SpEl, ThPh
- (T-25) Deuterium as an indicator of mechanism in the photodecomposition of ammonia. *J. Chem. Phys.*, 2: 452-453 (1934); C.A., 28: 6636. InKi, KiP

TAYLOR, H. S., and JUNGERS, J. C. (Continued)

- (T-26) Exchange between ammonia and deuterium on catalytic iron surfaces. *J. Am. Chem. Soc.*, 57: 660-661 (1935); *C.A.*, 29: 3893. EqH

TAYLOR, H. S., MORIKAWA, K., and BENEDICT, W. S.

- (T-27) Exchange reactions of deuterium and methane under the influence of excited mercury. *J. Am. Chem. Soc.*, 57: 383 (1935); *C.A.*, 29: 1712. EqG
- (T-28) Activation of specific bonds in complex molecules at catalytic surfaces. *J. Am. Chem. Soc.*, 57: 2735 (1935); *C.A.*, 30: 1733. EqH

TAYLOR, H. S., and SELWOOD, P. W.

- (T-29) Some properties of heavy water. *J. Am. Chem. Soc.*, 56: 998-999 (1934); *C.A.*, 28: 2967. AdG, ElRf, MeD, MeV, ThPh

TAYLOR, H. S., SWINGLE, W. W., EYRING, H., and FROST, A. H.

- (T-30) The effect of water containing the isotope of hydrogen upon fresh water organisms. *J. Cellular Comp. Phys.*, 4: 1-8 (1933). Bi
- (T-31) The effect of water containing the isotope of hydrogen upon fresh-water organisms. *J. Chem. Phys.*, 1: 751 (1933); *C.A.*, 28: 795. Bi

TAYLOR, J. K.

See TILTON, L. W.

TAYLOR, T. I.

- (T-32) Do the isotopes of an element have identical chemical properties? *Science*, 89: 176-177 (1939); *C.A.*, 33: 3687. Ge

TCHANG, Y. L.

- (T-33) Calculation of the potential function of the fundamental frequencies of the molecules $C_2H_xD_y$ ($x + y = 4$). *Ann. Soc. Sci. Bruxelles, Ser. I*, 58: 87-97 (1938); *C.A.*, 32: 4840. SpVi

See also DELFOSSE, J. M.; LEMAITRE, G.

TEAL, G. K.

See also UREY, H. C.

TEAL, G. K., and MACWOOD, G. E.

- (T-34) The Raman spectra of the isotopic molecules H_2 , HD and D_2 .
J. Chem. Phys., 3: 760-764 (1935); C.A., 30: 681. SpVi

TEIS, R. V.

- (T-35) Isotopic composition of rainwater. Compt. rend. acad. sci. U.R.S.S., 23: 674-678 (1939); C.A., 34: 4619. AbG
(T-36) Isotopic composition of water from some rivers and lakes of the U.S.S.R. Compt. rend. acad. sci. U.R.S.S., 24: 779-782 (1939); C.A., 34: 1783. AbG

See also VERNADSKII, V. I.

TEIS, R. V., and FLORENSKII, K. P.

- (T-37) Isotopic composition of snow. Compt. rend. acad. sci. U.R.S.S., 28: 70-74 (1940); C.A., 35: 2379. AbG
(T-38) Distribution of isotopes of hydrogen and oxygen during the freezing of water. Compt. rend. acad. sci. U.R.S.S., 32: 199-202 (1941); C.A., 37: 819. SeCr

TELLER, E.

See KALCKAR, F.; LORD, R. C., Jr.; SPONER, H.

TEMKIN, M.

- (T-39) Isotope of hydrogen and heavy water. Uspekhi Khim., 3: 217-235 (1934); C.A., 29: 6139. Ge
(T-40) Diffusion of heavy water into ordinary water. Nature, 136: 552 (1935); C.A., 29: 7793. MeDf

TERADA, T., and YAMAMOTO, R.

- (T-41) Cataphoresis of Chinese ink in water containing deuterium oxide. Proc. Imp. Acad. Tokyo, 11: 214-215 (1935); C.A., 29: 6815. EcC

TERAO, A., and INOUE, Y.

- (T-42) Effect of heavy water on the population growth of the water flea, *Moina macrocopa* Strauss. Proc. Imp. Acad. Tokyo, 10: 513-514 (1934); C.A., 29: 1843. BiZ

THEIS, K.

- (T-43) Heavy hydrogen in biological cellular processes. Wochschr. Brau., 55: 36-39 (1938); C.A., 32: 7499. Bi

THOMAS, H.

See FROMHERZ, H.; SONDERHOFF, R.

THOMAS, L. B., and OLMER, F.

- (T-44) The accommodation coefficients of He, Ne, A, H₂, D₂, O₂, CO₂ and Hg on platinum as a function of temperature. J. Am. Chem. Soc., 65: 1036-1043 (1943); C.A., 37: 4609. AdG

THOMAS, L. H.

See BENNETT, W. H.

THOMPSON, A. F., Jr., and CROMWELL, N. H.

- (T-45) Preparation and properties of aldehydes containing deuterium in the functional group. J. Am. Chem. Soc., 61: 1374-1376 (1939); C.A., 33: 6271. EqL, Sy

THOMPSON, H. W.

- (T-46) Thermodynamic functions and equilibria of formaldehyde, deuterioformaldehyde, phosgene and thiophosgene. Trans. Faraday Soc., 37: 251-260 (1941); C.A., 35: 6180. ThF

THOMPSON, J. W.

SEE ANGUS, W. R.; BAILEY, C. R.

THOMPSON, T. G.

See WIRTH, H. E.

THOMSON, D. W.

See ORR, W. J. C.

THOMSON, J. J. (Sir)

- (T-47) Heavy hydrogen. A lecture. Nature, 133: 280 (1934). AnMs, Ge

THUNBERG, S. F.

- (T-48) Investigations on the band spectra of boron hydride and boron deuteride. Z. Physik, 100: 471-477 (1936); C.A., 30: 5883. SpVi

THUNBERG, T.

- (T-49) Influence of heavy water on some enzymic dehydrogenation processes. Enzymologia, 3: 56-61 (1937); C.A., 31: 8564. BiC

THYS, L.

See ITTERBEEK, A. van

THYSSEN, S. van

- (T-50) Enrichment of deuterium oxide by electroosmosis. *Naturwissenschaften*, 26: 198 (1938); C.A., 32: 6526. SeEm

TICHENOR, R. L.

See KISTIAKOWSKY, G. B.

TIEDE, E., and LEMKE, H.

- (T-51) A lecture experiment demonstrating the freezing point of heavy water. *Ber.*, 71A: 589-590 (1938); C.A., 32: 4395. ThPh

TIGGELEN, A. van

See MUND, W.

TILTON, L. W., and TAYLOR, J. K.

- (T-52) Refractive index and dispersion of normal and heavy water. (research paper No. 703). *J. Research Natl. Bur. Standards*, 13: 207-209 (1934); C.A., 28: 7152. ElRf

TIMMERMANS, J., and BODSON, H.

- (T-53) Surface tensions of ordinary and heavy water. *Compt. rend.*, 204: 1804-1807 (1937); C.A., 31: 5640. MeSt

TIMMERMANS, J., and DEFFET, L.

- (T-54) Physical constants of heavy water. Variation of melting point with pressure. *Compt. rend.*, 200: 1661-1663 (1935); C.A., 29: 4648. ThPh

TIMMERMANS, J., HENNAUT-ROLAND, Mme., and ROZENTAL, D.

- (T-55) Change in volume of heavy water on freezing. *Compt. rend.*, 202: 1061-1063 (1936); C.A., 30: 3693. MeD, ThPh

TIMMERMANS, J., and POPPE, G.

- (T-56) Mutual solubility of heavy water and organic liquids. *Compt. rend.*, 201: 524-527 (1935); C.A., 29: 7759. SoH
- (T-57) Mutual solubility of heavy water and organic liquids in systems with negative saturation curve. *Compt. rend.*, 201: 608-610 (1935); C.A., 30: 356. SoH

TIMMERMANS, J., ROOSTER, J. de, and MICHEL, J.

- (T-58) Spontaneous crystallization and velocity thereof of water and

TIMMERMANS, J., ROOSTER, J. de, and MICHEL, J. (Continued)
heavy water. *Compt. rend.*, 208: 282-283 (1939); C.A.,
33: 2399. ThPh

TITANI, T.

(T-59) Application of heavy hydrogen and heavy oxygen in chemical investigations. A review. *Chem. Rev. Japan*, 6: 12-26 (1940); C.A., 35: 5383. InKi

See also HARADA, M.; ITO, M.; KOIZUMI, M.; MORITA, N.; OKABE, K.; YOSIDA, T.

TITANI, T., and HARADA, M.

(T-60) The isotopic fractionation of water due to evaporation and distillation. *Bull. Chem. Soc. Japan*, 10: 41-42 (1935); C.A., 29: 2841. SeDs

(T-61) The concentration of heavy (hydrogen) isotopes in carbohydrates. *Bull. Chem. Soc. Japan*, 10: 205 (1935); C.A., 29: 6139. AbO

(T-62) Concentration of the heavy (hydrogen) isotope in carbohydrates. *Bull. Chem. Soc. Japan*, 10: 261-263 (1935); C.A., 29: 7793. AbO

TITANI, T., ITO, M., and INOSHITA, K.

(T-63) Action of dilute heavy water on tubercle bacilli. *Osaka Ijishinshi*, 6, No. 6, (1935); C.A., 30: 7134. BiB

TITANI, T., KURANO, K., and HARADA, M.

(T-64) Concentration of deuterium by electrolysis of sulfuric acid solutions. *Bull. Chem. Soc. Japan*, 9: 269-271 (1934); C.A., 28: 6639. SeEl

TITANI, T., and MORITA, N.

(T-65) Comparison of the densities of conductivity water from Osaka, Japan, and Cambridge, U.S.A. *Bull. Chem. Soc. Japan*, 13: 409-418 (1938); C.A., 32: 8864. AbG

TITANI, T., and OKABE, K.

(T-66) The heavy-water content of oil-well brines. I. *Bull. Chem. Soc. Japan*, 11: 593-597 (1936); C.A., 31: 1991. AbG

TITANI, T., OKABE, K., and HARADA, M.

- (T-67) Concentration of deuterium by electrolysis of neutral salt solutions. I. Bull. Chem. Soc. Japan, 9: 272-273 (1934); C.A., 28: 6640. SeEl

TITANI, T., and YOSIDA, T.

- (T-68) Chain polymerization of styrene in solution. Polymerization of styrene in heavy alcohol. Proc. Imp. Acad. Tokyo, 16: 33-35 (1940); C.A., 34: 6592. KiL

TITMAN, H.

See PAYMAN, W.

TOBIANK, M.

See RIESENFELD, E. H.

TODA, M.

- (T-69) Solid states of H_2 and D_2 . Proc. Phys. Math. Soc. Japan, 22: 503-507 (1940); C.A., 34: 7693. Cr, MeD, ThF

TOHMFOR, G.

See NEUMANN, K.

TOLLENAAR, D.

See SMITS, A.

TONOSAKI, K.

- (T-70) Equilibrium in the reduction of molybdenum dioxide by deuterium. Bull. Inst. Phys. Chem. Research Tokyo, 19: 133-135 (1940); C.A., 34: 4967. EqG, EqH

TOPLEY, B.

See also HIRSHFELDER, J. O.; INGOLD, C. K.

TOPLEY, B., and EYRING, H.

- (T-71) Electrolytic separation of hydrogen isotopes and the mechanism of the cathode process. J. Am. Chem. Soc., 55: 5058-5059 (1933); C.A., 28: 967. SeEl
- (T-72) Electrolytic concentration of the heavy hydrogen isotopes. Nature, 133: 292 (1934); C.A., 28: 2989. SeEl
- (T-73) Separation of the hydrogen isotopes by electrolysis. J. Chem. Phys., 2: 217-230 (1934); C.A., 28: 4306. EqH, EqL, SeEl, ThPh

TOPLEY, B., and WYNNE-JONES, W. F. K.

- (T-74) Ionic product of heavy water. *Nature*, 134: 574 (1934); C.A., 29: 41. EqI

TORREY, H. C.

- (T-75) The viscosity of deuterium. *Phys. Rev.*, 47: 644 (1935); C.A., 30: 7400. MeV

TOURNAIRE, A., and VASSY, E.

- (T-76) Continuous spectrum of deuterium. *Compt. rend.*, 201: 957-958 (1935); C.A., 30: 680. SpA

- (T-77) Continuous molecular spectra of hydrogen and deuterium. *Compt. rend.*, 202: 562-564 (1936); C.A., 30: 2487. SpEl

TOWNDROW, R. P.

See PARTINGTON, J. R.

TRACE, J.

See BARBOUR, H. G.; SMITH, P. K.

TRELEASE, S. F.

See CRAIG, F. N.; CURRY, J.; PRATT, R.

TRENNER, N. R.

- (T-78) A thermal conductivity method for the determination of isotopic exchanges in the simpler gaseous molecules. *J. Chem. Phys.*, 5: 382-392 (1937); C.A., 31: 4855. AnTh

- (T-79) A gas density balance for determination of the absolute density of protium-deuterium mixtures and other gases. *J. Am. Chem. Soc.*, 59: 1391-1395 (1937); C.A., 31: 6510. AnDn

See also MORIKAWA, K.

TRENNER, N. R., MORIKAWA, K., and TAYLOR, H. S.

- (T-80) Reactions between atomic deuterium and the saturated aliphatic hydrocarbons. *J. Chem. Phys.*, 5: 203-211 (1937); C.A., 31: 3751. EqG, KiG, ThF

TREW, V. C. G., and SPENCER, J. F.

- (T-81) Diamagnetic susceptibility of heavy water. *Nature*, 137: 706 (1938); C.A., 30: 5475. ElMg

- (T-82) Diamagnetic susceptibility of heavy water. *Nature*, 137: 998 (1938); C.A., 30: 5846. ElMg

TRONSTAD, L.

- (T-83) Production of large quantities of heavy water. *Nature*, 133: 872 (1934); *C.A.*, 28: 5328. SeEl

See also BRUN, J.; FLOOD, H.; STOKLAND, K.

TRONSTAD, L., and BRUN, J.

- (T-84) Electrolytic enrichment of the heavy hydrogen isotope in water. *Z. Elektrochem.*, 40: 556-558 (1934); *C.A.*, 28: 6626. SeEl

- (T-85) Precision determinations of the densities of deuterium oxide and water. Electrolytic separation of the oxygen isotopes. *Trans. Faraday Soc.*, 34: 766-773 (1938); *C.A.*, 32: 6520. AnDn, SeEl

TRONSTAD, L., and FLOOD, H.

- (T-86) Formation of drops in supersaturated vapor of heavy water. *Nature*, 136: 476 (1935); *C.A.*, 29: 7757. MeSt

TRONSTAD, L., NORDHAGEN, J., and BRUN, J.

- (T-87) Density of 100 per cent heavy water. *Nature*, 136: 515 (1935); *C.A.*, 29: 7743. MeD

TRONSTAD, L., and STOKLAND, K.

- (T-88) Solutions of deuterium chloride and deuterium nitrate in heavy water. I, II. *Kgl. Norske Videnskab. Selskabs, Forh.*, 10: 129-136 (1937; pub. 1938); *C.A.*, 32: 6133. ElRf, MeD, Sy

- (T-89) Electrical conductivities and ion mobilities in heavy water. *Kgl. Norske Videnskab. Selskabs, Forh.*, 10: 141-144 (1937; pub. 1938); *C.A.*, 32: 6133. EcC, MeD

TRONSTAD, L., and WERGELAND, H.

- (T-90) Hydride and deuteride of lithium. I. *Kgl. Norske Videnskab. Selskabs, Forh.*, 10: 36-39 (1937; pub. 1938); *C.A.*, 32: 6124. CrX, EqH, MeD, ThPh

TRUCHEI, R.

- (T-91) Heavy chloroform, CDCl_3 . *Compt. rend.*, 202: 1997-1998 (1936); *C.A.*, 30: 6643. ElRf, MeD, SpVi, Sy, ThPh

TRUMPY, B.

- (T-92) Raman spectra of some deuterium compounds. *Nature*, 135: 764 (1935); *C.A.*, 29: 4673. SpVi

- (T-93) Raman effect and cis- trans-isomerism of hydrogen and deuterium compounds. *Kgl. Norske Videnskab. Selskabs. Skrifter*, II, No. 29: 1-14 (1935); *C.A.*, 30: 7455. SpVi, Sy

TRUMPY, B. (Continued)

- (T-94) The Raman spectrum of CD_2Br_2 . *Z. Physik*, 100: 250-252 (1936); *C.A.*, 30: 5128. SpVi, Sy

TUCHOLSKI, T.

- (T-95) Increase of the percentage of diplogen (deuterium) in water during very slow evaporation. *Nature*, 134: 29 (1934); *C.A.*, 28: 5754. SeDs
- (T-96) Reaction of oxygen with hydrogen on palladium. II. *Roczniki Chem.*, 17: 340-348 (1937); *C.A.*, 32: 6136. KiH
- (T-97) The reaction of hydrogen with oxygen on metallic palladium. *Z. physik. Chem.*, B40: 333-346 (1938); *C.A.*, 32: 8247. KiH

TUCHOLSKI, T., and RIDEAL, E. K.

- (T-98) The reaction of hydrogen and deuterium with ethylene at a nickel surface. *J. Chem. Soc.*, 1935: 1701-1704; *C.A.*, 30: 2091. KiH

TUCK, J. L.

See ELEY, D. D.

TUTTE, W. T.

See PRICE, W. C.

TWIGG, G. H.

- (T-99) The estimation of hydrogen deuteride by means of a micro-thermal-conductivity gage. *Trans. Faraday Soc.*, 33: 1329-1333 (1937); *C.A.*, 31: 8264. AnTh
- (T-100) Mechanism of catalytic exchange reactions between deuterium and olefins. *Trans. Faraday Soc.*, 35: 934-945 (1939); *C.A.*, 33: 9103. EqH, KiH
- (T-101) The catalytic isomerization of butene-1. *Proc. Roy. Soc. London*, A178: 106-117 (1941); *C.A.*, 35: 5775. InKi, KiH

See also CONN, G. K. T.; CRAXFORD, S. R.

TWIGG, G. H., and RIDEAL, E. K.

- (T-102) The exchange reaction between ethylene and deuterium on a nickel catalyst. *Proc. Roy. Soc. London*, A171: 55-69 (1939); *C.A.*, 33: 5732. EqH, InKi

TYKOCINER, J. T., and BLOOM, L. R.

- (T-103) The effect of deuterium and of electric discharges in deuterium oxide on the sensitization of photoelectric cells. *Phys. Rev.*, 57: 571 (1940); *C.A.*, 35: 4687. ElGd

UBBELOHDE, A. R.

- (U-1) The expansion pressures of metallic hydrogen and deuterium. *Nature*, 138: 845 (1936); C.A., 31: 1282. MeD
- (U-2) Some properties of the metallic state. II. Metallic hydrogen and deuterium. *Proc. Roy. Soc. London*, A159: 306-313 (1937); C.A., 31: 7820. AdG, Cr, EcC
- (U-3) Modern thermodynamics. *Uspekhi Fiz. Nauk*, 20: 281-316 (1938); C.A., 33: 4835. EqG, EqH
- (U-4) A multiple-exposure x-ray spectrometer. *J. Sci. Instruments*, 16: 155-161 (1939); C.A., 33: 6149. CrX
- (U-5) Structure and thermal properties associated with some hydrogen bonds in crystals. III. Further examples of the isotope effect. *Proc. Roy. Soc. London*, A173: 417-427 (1939); C.A., 34: 1221. CrX, Sy

See also ROBERTSON, J. M.

UBBELHODE, A. R., and WOODWARD, I.

- (U-6) Isotope effect in potassium dihydrogen phosphate. *Nature*, 144: 632 (1939); C.A., 34: 300. CrX, Sy
- (U-7) Structure and thermal properties associated with some hydrogen bonds in crystals. IV. Isotope effects in some acid phosphates. *Proc. Roy. Soc. London*, A179: 399-407 (1942); C.A., 36: 3079. CrX

UENO, S., and UENO, Y.

- (U-8) Hydrogenation of unsaturated acids with deuterium. *J. Chem. Soc. Japan*, 57: 794-797 (1936); C.A., 31: 1237. KiH

UENO, Y.

See UENO, S

UHLMANN, W.

- (U-9) Enrichment of the heavy hydrogen isotope. *Naturwissenschaften*, 22: 119-120 (1934); C.A., 28: 3657. Se

See also KLUGE, W.

UNGER, H. J.

See NORRIS, W. V.

UREY, H. C.

- (U-10) Separation and properties of the isotopes of hydrogen. *Science*, 78: 566-571 (1933); *C.A.*, 28: 1922. Ge
- (U-11) A diffusion method of separation of isotopes (title only). *Phys. Rev.*, 44: 314 (1933). SeDf
- (U-12) Chemical properties of the hydrogen isotopes. *Rev. Sci. Instruments*, 4: 423-425 (1933). Ge
- (U-13) Willard Gibbs medal award to Harold C. Urey. Significance of the hydrogen isotopes. *Ind. Eng. Chem.*, 26: 803-806 (1934); *C.A.*, 28: 4977. Ge
- (U-14) Deuterium and its compounds in relation to biology. A review. *Cold Spring Harbor Symposia Quant. Biol.*, 2: 47-56 (1934); *C.A.*, 29: 8026. Bi, Ge
- (U-15) Some thermodynamic properties of hydrogen and deuterium. Nobel Lecture. *Angew. Chem.*, 48: 315-320 (1935); *C.A.*, 29: 5141. Ge
- (U-16) The separation of isotopes. A review. *Pubs. Am. Assoc. Advancement Sci.*, No. 7; Recent advances in surface chemistry. *Chem. Phys.*, 73-87 (1939); *C.A.*, 33: 8109. SeCf, SeCh, SeDf, SeDs, SeMs
- (U-17) Separation of isotopes by chemical means. *J. Wash. Acad. Sci.*, 30: 277-294 (1940); *C.A.*, 34: 6880. SeCh, SeDs, ThPh
- (U-18) Separation of isotopes. *Phys. Soc. Rep. Progress Phys.*, 6: 48-77 (1940); *C.A.*, 35: 3493. Se

See also BRADLEY, C. A., Jr.; BRICKWEDDE, F. G.; COHEN, K.; CRIST, R. H.; FINK, C. O.; KIRSHENBAUM, I.; La MER, V. K.; MACWOOD, G. E.; RITTENBERG, D.; SCOTT, R. B.; WAHL, M. H.; WASHBURN, E. W.

UREY, H. C., BRICKWEDDE, F. G., and MURPHY, G. M.

- (U-19) A hydrogen isotope of mass 2. *Phys. Rev.*, 39: 164-165 (1932); *C.A.*, 26: 1857. SpA
- (U-20) An isotope of hydrogen of mass 2 and its concentration. An abstract. *Phys. Rev.*, 39: 864 (1932). Ab
- (U-21) The hydrogen isotope of mass 2 and its concentration. *Phys. Rev.*, 40: 1-15 (1932); *C.A.*, 26: 4242. Ab, SeDs, Sp, ThF
- (U-22) Relative abundance of H^1 and H^2 in natural hydrogen. *Phys. Rev.*, 40: 464-465 (1932); *C.A.*, 26: 4243. Ab

- UREY, H. C., BRICKWEDDE, F. G., and MURPHY, G. M. (Continued)
- (U-23) Names for the hydrogen isotopes. *Science*, 78: 602-603 (1933). No
- (U-24) Designation of heavy hydrogen. *Nature*, 133: 173 (1934); *C.A.*, 28: 1599. No
- UREY, H. C., and GREIFF, L. J.
- (U-25) Isotopic exchange equilibria. *J. Am. Chem. Soc.*, 57: 321-327 (1935); *C.A.*, 29: 2842. Eq, Ge, SeCh
- UREY, H. C., MURPHY, G. M., and BRICKWEDDE, F. G.
- (U-26) A name and symbol for H^2 . *J. Chem. Phys.*, 1: 512-513 (1933); *C.A.*, 27: 4476. No
- UREY, H. C., and PRICE, D.
- (U-27) The synthesis of tetradeuteromethane. *J. Chem. Phys.*, 2: 300 (1934); *C.A.*, 28: 4033. KiH, Sy
- UREY, H. C., and RITTENBERG, D.
- (U-28) Some thermodynamic properties of the H^1H^2 , H^2H^2 molecules and compounds containing the H^2 atom. *J. Chem. Phys.*, 1: 137-143 (1933); *C.A.*, 27: 1811. EcP, EqG, ThF
- UREY, H. C., and TEAL, G. K.
- (U-29) The hydrogen isotope of atomic weight two. *Rev. Modern Phys.*, 7: 34-94 (1935); *C.A.*, 29: 2442. Ge
- UREY, H. C., and WAHL, M. H.
- (U-30) A cascade electrolytic process for separating the hydrogen isotopes. An abstract. *Phys. Rev.*, 45: 566 (1934); *C.A.*, 29: 4664. SeEl
- URIZKO, M. I.
- See KORCHAGIN, L. V.
- USSING, H. H.
- (U-31) The influence of heavy water on the development of amphibian eggs. *Acta. Physiol. Scand.* 72: 192-198 (1935); *C.A.*, 30: 124. BiZ
- (U-32) The exchange of hydrogen and deuterium atoms between water and protein in vivo and in vitro. *Acta Physiol. Scand.*, 77: 107-122 (1937); *C.A.*, 32: 610. InBi

USSING, H. H. (Continued)

- (U-33) The exchange of hydrogen and deuterium atoms between water and protein in vitro and in vivo. *Acta Physiol. Scand.*, 78: 225-241 (1938); *C.A.*, 32: 5009. InBi
- (U-34) Use of amino acids containing deuterium to follow protein production in the organism. *Nature*, 142: 399-400 (1938); *C.A.*, 32: 8538. InBi, Sy
- (U-35) The rate of protein renewal in mice and rats studied by means of heavy hydrogen. *Acta Physiol. Scand.*, 2: 209-221 (1941); *C.A.*, 36: 1991. InBi
- (U-36) The fate or metabolism of deuterium introduced in some amino acids by heating with D₂O and sulfuric acid. *Acta Physiol. Scand.*, 2: 222-226 (1941); *C.A.*, 36: 1959. InBi, Sy

See also FENGER-ERIKSEN, K.; KROGH, A.

USSING, H. H., and WERNSTEDT, A.

- (U-37) A distillation device for small water samples. *Acta Physiol. Scand.*, 83: 169-174 (1940); *C.A.*, 35: 5607. AnDn

UTTERBACK, C. L.

See WIRTH, H. E.

VANCE, J. E.

See MURPHY, G. M.

VAN CLEAVE, A. B., and GRUBB, A. C.

(V-1) Evidence for the formation of active hydrogen. *Nature*, 132: 1001 (1933); *C.A.*, 28: 1276. *EcO*

VAN CLEAVE, A. B., and MAASS, O.

(V-2) Molecular diameter of deuterium as determined by viscosity measurements. *Can. J. Research*, 12: 57-62 (1935); *C.A.*, 29: 2409. *MeV*

(V-3) Thermal conductivity of deuterium. *Can. J. Research*, 12: 372-376 (1935); *C.A.*, 29: 3903. *ThF*

(V-4) The viscosities of deuterium-hydrogen mixtures. *Can. J. Research*, 13B: 384-389 (1935); *C.A.*, 30: 2067. *MeV*

VAN DIJK, H.

See KEESOM, W. H.

van DINGENEN, W.

See DINGENEN, W. van

VANDONINCK, W.

See ITTERBEEK, A. van

van HEYNINGEN, W. E.

See HEYNINGEN, W. E. van

van ITTERBEEK, A.

See ITTERBEEK, A. van

van PAEMEL, O.

See PAEMEL, O. van

VANPEE, M.

See MUND, W.

van THYSSEN, S.

See THYSSEN, S. van

van TIGGELEN, A.

See MUND, W.

VAN VLECK, J. H.

- (V-5) The isotope corrections in molecular spectra. J. Chem. Phys., 4: 327-338 (1936); C.A., 30: 4758. SpVi

VAN VLECK, J. H., and CROSS, P. C.

- (V-6) A calculation of vibration frequencies and other constants of the water molecule. J. Chem. Phys., 1: 357-361 (1933); C.A., 27: 3862. SpVi

VAN VOORHIS, S. N.

See HARNWELL, G. P.

VASIL'EV, A. M.

- (V-7) Hydrogen isotope and heavy water. Trans. Kirov Inst. Chem. Technol. Kazan, No. 2: 129-149 (1934); C.A., 29: 3595. Ge

VASSEY, E.

See TOURNAIRE, A.

VEGARD, L.

- (V-8) The isotope effect in the replacement of H by D in solid H_2S and H_2Se . Avhandl. Norske Videnskaps-Akad. Oslo I. Mat. Naturv. Klasse No. 6: 3-12 (1943). Chem. Zentr., I: 342 (1944); C.A., 39: 2239. CrX

VEGARD, L., and HILLESUND, S.

- (V-9) Structure of a few D compounds and comparison with that of corresponding H compounds. Avhandl. Norsk Videnskaps-Akad. Oslo I. Mat. Naturv., Klasse No. 8: 24 pp. (1942); C.A., 38: 4488. CrX

VEGARD, L., and OSERD, L. S.

- (V-10) Isotope effect for the exchange of H and D in solid H_2S and H_2Se . Avhandl. Norske Videnskaps-Akad. Oslo I. Mat. Naturv., Klasse No. 7: 19 pp. (1942); C.A., 38: 4488. CrX

VEIL, S.

- (V-11) Isotopes of hydrogen and their separation. A review. Rev. Sci., 72: 174-177 (1934); C.A., 28: 3298. Ge

VELGHE, C.

See HEMPTINNE, M. de

VERESCHCHAGIN, G. Y., GORBOV, A. I., and MENDELEEV, I. I.

- (V-12) Natural water of abnormal density. Compt. rend. acad. sci. U.R.S.S., 22: 131-134 (1934). AbG

VEREYCKEN, W.

See ITTERBEEK, A. van

VERLEGER, H.

See HERZBERG, G.

VERLEYSSEN, A.

See BERNHARD, E.; MANNEBACK, C.

VERLEYSSEN, A., and MANNEBACK, C.

- (V-13) Calculation of the fundamental plane modes of vibration of the molecules C_2H_4 , C_2D_4 and $C_2H_2D_2$. Ann. soc. sci. Bruxelles., Ser. I, 57: 31-38 (1937); C.A., 32: 11. SpVi

VERMAELEN, R.

See ITTERBEEK, A. van

VERMILLION, H. E., WERBEL, B., SAYLOR, J. H., and GROSS, P. M.

- (V-14) Solubility studies. VI. The solubility of nitrobenzene in deuterium water and in ordinary water. J. Am. Chem. Soc., 63: 1346-1347 (1941); C.A., 35: 4265. SoH

VERNADSKII, V. I. (VERNADSKY, W. I.)

- (V-15) Where to search for heavy water from the geochemical point of view. Compt. rend., 199: 694-696 (1934); C.A., 29: 84. AbG

VERNADSKII, V. I., VINOGRADOV, A. P., and TEIS, R. V.

- (V-16) Determination of the isotopic composition of waters in metamorphic rocks and minerals. Compt. rend. acad. sci. U.R.S.S., 31: 573-576 (1941); C.A., 37: 587. AbG, AnDn

VERZAR, F.

See also ERLNMEYER, H.; McDOUGALL, E. J.

VERZAR, F., and HAFFTER, C.

- (V-17) The effect of heavy water (deuterium oxide) on isolated organs. Arch. ges. Physiol. Pfluegers, 236: 714-716 (1936); C.A., 30: 4880. Bi

VIALARD, R.

See CHAMPETIER, G.

VIGNEAUD, V. du

See also PATTERSON, W. I.; SIMMONDS, S.

VIGNEAUD, V. du, COHN, M., BROWN, G. B., IRISH, O. J., SCHOENHEIMER, R., and RITTENBERG, D.

- (V-18) The inversion of *d*-phenylaminobutyric acid and acetylation of *l*-phenylaminobutyric acid by means of the isotopes of nitrogen and hydrogen. J. Biol. Chem., 131: 273-296 (1939); C.A., 34: 142. InKi, KiB

VINAL, G. W.

See BRICKWEDDE, L. H.

VINCART, G.

- (V-19) Deuterium or diplogen. A review. Ing. chim., 18: 128-131 (1934); C.A., 28: 7151. No

VINOGRADOV, A. P.

See VERNADSKII, V. I.

VISSCHER, M. B.

See also PETERS, H. C.

VISSCHER, M. B., FETCHER, E. S., Jr., CARR, C. W., GREGOR, H. P., BUSHEY, M. S., and BARKER, D. E.

- (V-20) Isotopic-tracer studies on the movement of water and ions between intestinal lumen and blood. Am. J. Physiol., 142: 550-575 (1944); C.A., 39: 742. InBi

VODAR, B.

See DOUCET, J.

VOLL, H.

See DOEHLEMAN, E.

von DUNGERN, M. F.

See DUNGERN, M. F. von

von HEVESY, G.

See HEVESY, G. von

von WICKLEN, F. C.

See CALDWELL, M. L.

VOSKUYL, R. J.

See GREENE, C. H.

WADA, T.

See FUJIOKA, Y.

WAELSCH, H.

See also SPERRY, W. M.

WAELSCH, H., SPERRY, W. M., and STOYANOFF, V. A.

- (W-1) A study of the synthesis and deposition of lipides in brain and other tissues with deuterium as an indicator. J. Biol. Chem., 135: 291-296 (1940); C.A., 34: 6683. InBi
- (W-2) Lipide metabolism in brain during myelination. J. Biol. Chem., 135: 297-302 (1940); C.A., 34: 6684. InBi

WAHL, A. C.

See SEABORG, G. T.

WAHL, M. H.

See also BRICKWEDDE, F. G.; SCOTT, R. B.; UREY, H. C.

WAHL, M. H., and UREY, H. C.

- (W-3) Vapor pressures of the isotopic forms of water. J. Chem. Phys., 3: 411-414 (1935); C.A., 29: 5711. SeDs, ThPh

WALCHER, W.

- (W-4) Separation of isotopes. *Ergeb. exakt. Naturw.*, 18: 155-228 (1939); C.A., 34: 23. Ge, Se

WALD, M.

See MARK, H.

WALDMANN, L.

- (W-5) The theory of the gas-separation process of Clusius and Dickel. *Naturwissenschaften*, 27: 230-231 (1939); C.A., 33: 6672. SeDf

WALDMANN, L. (Continued)

- (W-6) Theory of the isotope separation process of Clusius and Dickel. I. Z. Physik, 114: 53-81 (1939); C.A., 34: 1557. SeDf

See also CLUSIUS, K.

WALL, F. T.

See GLOCKLER, G.

WALLIS, E. S.

See BURWELL, R. L., Jr.

WALTER, J.

See GORIN, E.

WALTERS, W. D.

- (W-7) Polymerization and condensation of formaldehyde in heavy water. Z. physik. Chem., A182: 275-277 (1938); C.A., 33: 129. InKi
- (W-8) Exchange reaction of biacetyl with deuterium oxide. J. Am. Chem. Soc., 63: 2850-2851 (1941); C.A., 36: 408. EqL, KiL

See also BONHOEFFER, K. F.; HERR, D. S.

WALTERS, W. D., and BONHOEFFER, K. F.

- (W-9) Velocity of hydrogen-atom exchange of acetone in dilute aqueous sodium hydroxide. Z. physik. Chem., A182: 265-274 (1938); C.A., 33: 28. KiL

WALTON, H. F.

- (W-10) The manipulation of the Farkas microthermal conductivity analysis apparatus. Trans. Faraday Soc., 34: 450-451 (1938); C.A., 32: 4386. AnTh

See also EDWARDS, A. J.

WALTON, H. F., and WOLFENDEN, J. H.

- (W-11) Temperature coefficient of the electrolytic separation of the hydrogen isotopes. Nature, 138: 468 (1936); C.A., 30: 8041. SeEl

WALTON, H. F., and WOLFENDEN, J. H. (Continued)

- (W-12) The electrolytic separation factor of deuterium at very low concentrations. J. Chem. Soc., 1937: 1677-1679; C.A., 32: 1186. SeEl
- (W-13) The electrolytic separation of deuterium: the influence of temperature and current density at various cathode metals. Trans. Faraday Soc., 34: 436-449 (1938); C.A., 32: 4084. SeEl

WANNIER, G.

- (W-14) The mobility of hydrogen and hydroxyl ions in aqueous solutions. II. Ann. Physik, 24: 569-590 (1935); C.A., 30: 1637. EcC

WANSBROUGH-JONES, O. H.

- (W-15) Recent advances in science; Physical Chemistry. A review. Science Progress, 28: 107-115 (1933); C.A., 27: 3877. Ge

WARHURST, E.

See BAXENDALE, J. H.

WARREN, J.

See BARNES, T. C.

WASHBURN, E. W.

- (W-16) The need of adequate provision for the quantity production of deuterium water. Science, 78: 555-556 (1933). Ge
- (W-17) Isotopic fractionation of water (title only). Phys. Rev., 44: 314 (1933). SeDs

See also PATENTS, U.S.

WASHBURN, E. W., and SMITH, E. R.

- (W-18) The isotopic fractionation of water by distillation and by adsorption. J. Chem. Phys., 1: 426 (1933); C.A., 27: 3865. SeAd, SeDs
- (W-19) The isotopic fractionation of water by physiological process. Science, 79: 188-189 (1934); C.A., 28: 2379. AbO
- (W-20) An examination of water from various natural sources for variations in isotopic composition (research paper No. 656). J. Research Natl. Bur. Standards, 12: 305-311 (1934); C.A., 28: 3657. AbG, AbO, AnDn

WASHBURN, E. W., SMITH, E. R., and FRANDSEN, M.

- (W-21) The isotopic fractionation of water (research paper No. 601). J. Research Natl. Bur. Standards. 11: 453-462 (1933); C.A., 28: 706. AnDn, ElRf, MeD, SeAd, SeDs, SeEl, ThPh
(W-22) The isotopic fractionation of water. J. Chem. Phys., 1: 288 (1933); C.A., 28: 1265. SeEl
(W-23) The isotopic fractionation of water. An abstract. Science, 77: 458 (1933). Se

WASHBURN, E. W., SMITH, E. R., and SMITH, F. A.

- (W-24) Fractionation of the isotopes of hydrogen and of oxygen in a commercial electrolyzer (research paper No. 729), J. Research Natl. Bur. Standards, 13: 599-608 (1934); C.A., 29: 1708. SeEl

WASHBURN, E. W., and UREY, H. C.

- (W-25) Concentration of the H^2 isotope of hydrogen by the fractional electrolysis of water. Proc. Natl. Acad. Sci. U.S., 18: 496-498 (1932); C.A., 26: 5003. SeEl

WATANABE, A.

See SHIBATA, K.

WATERS, C. E.

- (W-26) The case of deuterium. Science, 79: 271-272 (1934). No

WATSON, W. W.

- (W-27) Mass ratios of isotopes from band spectra. Phys. Rev., 46: 319 (1934); C.A., 28: 6632. SpEl
(W-28) Comparison of the spectra of CaH and CaD. Phys. Rev., 47: 27-32 (1935); C.A., 29: 2082. SpEl
(W-29) Mass ratio of hydrogen and deuterium from band spectra. Phys. Rev., 49: 70-72 (1936); C.A., 30: 3322. SpEl

WATSON, W. W., FREDRICKSON, W. R., and HOGAN, M. E., Jr.

- (W-30) Strontium deuteride and hydride spectra. Phys. Rev., 49: 150-155 (1936); C.A., 30: 2105. SpEl

WEBB, W. A.

- (W-31) The manufacture of deuterium and its compounds. Chem. Eng. News., 12: 63 (1934); C.A., 28: 2608. SeEl, Sy

See also PATENTS, U.S.; RANDALL, M.

WEBER, H. M.

See ERLENMEYER, H.

WEBER, L. A.

See WOGLOM, W. H.

WEI, Y. C.

See CHANG, T. L.

WEIGAND, K.

See CLUSIUS, K.

WEISER, H. H.

(W-32) Influences of deuterium oxide on growth and morphology of lactobacilli. Proc. Soc. Exptl. Biol. Med., 36: 151-152 (1937); C.A., 31: 8553. BiB

WEISSMAN, N., and SCHOENHEIMER, R.

(W-33) Protein metabolism. XV. The relative stability *l*(+)-lysine in rats studied with deuterium and heavy nitrogen. J. Biol. Chem., 140: 779-795 (1941); C.A., 35: 7482. EqL, InBi, Sy

WELCH, A. J. E.

(W-34) Isotope separation by thermal diffusion. A review. Sci. J. Roy. Coll. Sci., 11: 19-30 (1941); C.A., 36: 965. SeDf

WELDON, L. H. P.

See also BAILEY, C. R.; HOBDEN, F. W.

WELDON, L. H. P., and WILSON, C. L.

(W-35) Preparation of partly deuteriated benzenes. Nature, 137: 70 (1936); C.A., 30: 2555. Sy

WENTZEL, H. R.

See HALL, N. F.

WERBEL, B.

See VERMILLION, H. E.

WERGELAND, H.

(W-36) Heat of formation of heavy water. Kgl. Norske Videnskab. Selskabs. Forh., 10, No. 7: 24-27 (1937; pub. 1938). C.A., 32: 6143. ThF

WERGELAND, H. (Continued)

(W-37) Hydride and deuteride of lithium. II. Kgl. Norske Videnskab. Selskabs. Forh., 10: 56-59 (1937); C.A., 32: 6124. EqH, MeD, ThF

(W-38) Hydride and deuteride of lithium. III. Kgl. Norske Videnskab. Selskabs. Forh., 10: 60-63 (1937); C.A., 32: 6124. EqH

See also TRONSTAD, L.

WERNSTEDT, A.

See USSING, H.

WESTLING, E. N

See HACKH, I. W. D.

WHEELER, A.

(W-39) The relative adsorbabilities of hydrogen and deuterium. J. Chem. Phys., 6: 746-748 (1938); C.A., 33: 21. AdG

See also PEASE, R. N.

WHEELER, A., and PEASE, R. N.

(W-40) The relative rates of combination of H and D with C_2H_4 . J. Am. Chem. Soc., 58: 1665-1668 (1936); C.A., 30: 7976. KiH, MeV

WHITAKER, H.

See INGOLD, E. H.

WHITE, H. E.

See BALLARD, S. S.

WHITMORE, F. C.

(W-41) Suggested nomenclature for heavy hydrogen and its compounds. Science, 78: 603 (1933). No

WHITMORE, F. C., FLEMING, G. H., RANK, D. H., BORDNER, E. R., and LARSEN, K. D.

(W-42) Neopentyl deuteride. J. Am. Chem. Soc., 56: 749 (1934); C.A., 28: 2669. ElRf, SpVi, Sy, ThPh

WHYTLAW-GRAY, R.

See INGOLD, E. H.

WICK, G. C.

- (W-43) The spectrum of rotation-vibration of the molecule HD. Atti. accad. nazl. Lincei, 21: 708-714 (1935); C.A., 30: 1655. SpVi

WICKLEN, F. C. von

See CALDWELL, M. L.

WIDIGER, A. H., and BROWN, W. G.

- (W-44) Fractionation of the hydrogen isotopes in the distillation of ethyl alcohol. J. Am. Chem. Soc., 61: 2453-2454 (1939); C.A., 33: 8463. SeDs

WIDMANN, A.

See JOST, W.

WIESSMER, P.

See ERLENMEYER, H.

WIGNER, E.

See FARKAS, L.

WILD, N. E.

See HEATH, H. R.

WILDNER, E. L.

See BEBBE, R. A.

WILKS, G. C.

See IVES, D. J. G.

WILLEMART, A.

See DUVEEN, D.

WILLIAMS, D.

See also PLYLER, E. K.

WILLIAMS, D., and PLYLER, E. K.

- (W-45) The infrared spectrum of heavy acid solution. J. Chem. Phys., 4: 460 (1936); C.A., 30: 5887. SpVi
- (W-46) The infrared absorption of heavy acid solutions. J. Am. Chem. Soc., 59: 319-321 (1937); C.A., 31: 2514. SpVi

WILLIAMS, R. C.

- (W-47) The fine structure of $H\alpha$ and $D\alpha$ under varying discharge conditions. Phys. Rev., 54: 558-567 (1938); C.A., 33: 478. SpA
- (W-48) Determination of e/m from the $H\alpha$ and $D\alpha$ interval. Phys. Rev., 54: 568-572 (1938); C.A., 33: 477. SpA

See also GIBBS, R. C.

WILLIAMS, R. C., and GIBBS, R. C.

- (W-49) The fine structure of H^2 . An abstract. Phys. Rev., 44: 325 (1933). SpA
- (W-50) Fine-structure analysis of $H^1\alpha$ and $H^2\alpha$. Phys. Rev., 45: 475-479 (1934); C.A., 28: 3300. SpA
- (W-51) Fine structure of $D\alpha$ with increased resolution. Phys. Rev., 48: 971 (1935); C.A., 30: 957. SpA
- (W-52) Fine structure of α -lines of hydrogen and deuterium. Phys. Rev., 49: 416 (1936); C.A., 31: 5676. SpA

WILLIAMS, R. J.

- (W-53) Microdetermination of active hydrogen with deuterium oxide. J. Am. Chem. Soc., 58: 1819-1820 (1936); C.A., 30: 7400. InKi

WILLIAMS, V.

See also HERMAN, R. C.; SMITH, L. G.

WILLIAMS, V., HOFSTADTER, R., and HERMAN, R. C.

- (W-54) Vibration spectra and molecular structure. VIII. Absorption spectra of light and heavy phenol and aniline vapors. J. Chem. Phys., 7: 802-805 (1939); C.A., 33: 8115. SpVi, Sy

WILLIAMS, W. E.

See DRINKWATER, J. W.

WILLIAMSON, A. T.

See HINSHELWOOD, C. N.

WILSON, C. L.

- (W-55) Preparation of organic compounds containing deuterium. Dideuteriomalonic deuterio acid (malonic acid- d_4) and trideuterioacetic deuterioacid (acetic acid- d_4). J. Chem. Soc., 1935: 492-494; C.A., 29: 4333. Sy, ThPh

WILSON, C. L. (Continued)

- (W-56) Vapor pressure of hexadeuteriobenzene (benzene-d₆). *Nature*, 136: 301 (1935); *C.A.*, 29: 7165. ThPh
- (W-57) Structure of benzene. IX. Direct observation of the fluorescence spectra of benzene and hexadeuteriobenzene (benzene-d₆) vapor in the region of absorption. *J. Chem. Soc.*, 1936: 1210-1214; *C.A.*, 30: 8024. SpFl
- (W-58) Prototropy in relation to the exchange of hydrogen isotopes. II. A comparison of the velocities of dissociation of a proton and a deuteron from a ψ -acid. *J. Chem. Soc.*, 1936: 1550-1553; *C.A.*, 31: 391. KiL, Sy

See also ANGUS, W. R.; BAILEY, C. R.; BEST, A. P.; DAY, J. N. E.; HOBDEN, F. W.; HSU, S. K.; HUGHES, E. D.; INGOLD, C. K.; NEVELL, T. P.; SALAS, E. de; WELDON, L. H. P.

WILSON, C. L., and WYLIE, A. W.

- (W-59) Preparation of tetradeuterioethylene dibromide by direct union of dideuterioacetylene and deuterium bromide. A route to tetradeuterioethylene. *J. Chem. Soc.*, 1941: 596-601; *C.A.*, 36: 397. Sy

WILSON, E. B. Jr.

- (W-60) Statistical weights of the rotational levels of polyatomic molecules, including methane, ammonia, benzene, cyclopropane and ethylene. *J. Chem. Phys.*, 3: 276-285 (1935); *C.A.*, 29: 4262. SpVi
- (W-61) Nuclear spin and symmetry effects in the heat capacity of ethane gas. *J. Chem. Phys.*, 6: 740-745 (1938); *C.A.*, 33: 33. SpVi

WILSON, G. H.

- (W-62) The theory of gaseous-isotope separation in a force field with application to the ultracentrifuge. *Phys. Rev.*, 58: 209 (1940); *C.A.*, 36: 3430. SeCf

WILSON, T. P.

- (W-63) Infrared and Raman spectra of polyatomic molecules. XVIII. Trideuteronitromethane. *J. Chem. Phys.*, 11: 361-368 (1943); *C.A.*, 37: 6551-6552. SpVi, Sy

WINTER, A.

See GUENTHERSCHULZE, A.

WIRTH, H. E., THOMPSON, T. G., and UTTERBACK, C. L.

- (W-64) Distribution of isotopic water in the sea. *J. Am. Chem. Soc.*, 57: 400-404 (1935); C.A., 29: 6499. AbG

WIRTZ, K.

- (W-65) Exchange of heavy hydrogen atoms between hydrogen and ammonia. *Naturwissenschaften*, 23: 721-722 (1935); C.A., 30: 945. EqG
- (W-66) Exchange equilibrium between deuterium and ammonia. *Z. physik. Chem.*, B30: 289-297 (1935); C.A., 30: 1539. EqG
- (W-67) Equilibrium of the exchange reactions with deuterium. An abstract. *Physik. Z.*, 37: 165 (1936). EqG
- (W-68) Equilibrium constants for the exchange reactions: $\text{HCl} + \text{HD} = \text{DCl}_2 + \text{H}_2$ and $\text{HBr} + \text{HD} = \text{DBr} + \text{H}_2$. *Z. physik. Chem.*, B31: 309-318 (1936); C.A., 30: 3703. EqG
- (W-69) Determination of the deuterium content of hydrogen mixtures by the microthermal conductivity method of Farkas. *Z. physik. Chem.*, B32: 334-340 (1936); C.A., 30: 5145. AnTh
- (W-70) The heavy hydrogen isotope. A review. *Z. physik. chem. Unterricht*, 49: 14-28 (1936); C.A., 30: 5474. Ge
- (W-71) The estimation of equilibria of exchange reactions with deuterium and polyatomic molecules. *Z. physik. Chem.*, B34: 121-140 (1936); C.A., 31: 598. EqL
- (W-72) Exchange equilibria of the hydrogen isotope between water and polyatomic molecules. *Z. Elektrochem.*, 43: 662-663 (1937); C.A., 31: 7727. EqL
- (W-73) Exchange velocities of protons and deuterons between water molecules. *Z. Physik.*, 104: 613-618 (1937). KiL
- (W-74) Specific gravity of D_2O at various temperatures. *Naturwissenschaften*, 30: 330-332 (1942); C.A., 37: 3986. MeD
- (W-75) Specific gravity and concentration of heavy water. *Physik. Z.*, 43: 465-469 (1942); C.A., 37: 6539. MeD
- (W-76) Isotope separation by thermal diffusion in liquids according to kinetic theory. *Naturwissenschaften*, 31: 349 (1943); C.A., 38: 1673. SeDf

See also JUNGERS, J. C.

WIRTZ, K., and BONHOEFFER, K. F.

- (W-77) The reaction of formaldehyde with hydrogen peroxide in heavy water. Proof of the lack of exchange of the hydrogen atoms in formaldehyde. *Z. physik. Chem.*, B32: 108-112 (1936); C.A., 30: 4815. EqQ

WISCHIN, A.

See GROSS, P.

WITMER, E. E.

- (W-78) The masses and magnetic moments of the proton, neutron, and deuteron. *Phys. Rev.*, 56: 214 (1939); *C.A.*, 35: 4684. NuM, NuMg
- (W-79) The theoretical magnetic susceptibility of molecular deuterium as compared with that of molecular hydrogen. An abstract. *Phys. Rev.*, 58: 202 (1940); *C.A.*, 36: 3422. ElMg
- (W-80) The calculation of the magnetic susceptibility of H_2 , HD and D_2 by quantum mechanics. *Phys. Rev.*, 61: 387 (1942); *C.A.*, 37: 2976. ElMg

WOGLOM, W. H., and WEBER, L. A.

- (W-81) Heavy water and tumor growth. *J. Am. Med. Assoc.*, 102: 1289-1290 (1934); *C.A.*, 29: 3696. BiZ

WOJCIECHOWSKI, M.

See SMITH, E. R.

WOLF, F.

- (W-82) Passage of heavy and light hydrogen ions through argon gas. *Ann. Physik*, 28: 361-374 (1937); *C.A.*, 31: 3377. MeDf

WOLFENDEN, J. H.

See BELL, R. P.; EDWARDS, A. J.; HINSHELWOOD, C. N.; SMALL, P. A.; WALTON, H. F.

WOOD, R. W.

- (W-83) Raman spectrum of heavy water. *Science*, 78: 578 (1933); *C.A.*, 28: 1927. SpVi
- (W-84) Raman spectrum of heavy water. *Nature*, 132: 970 (1933); *C.A.*, 28: 1927. SpVi
- (W-85) Raman spectrum of heavy water. *Nature*, 133: 106 (1934); *C.A.*, 28: 2998. SpVi
- (W-86) Raman spectrum of heavy water. *Science*, 79: 35 (1934); *C.A.*, 28: 1602. SpVi
- (W-87) The Raman spectrum of heavy water. An abstract. *Phys. Rev.*, 45: 297 (1934). SpVi
- (W-88) Raman spectrum of heavy water. *Phys. Rev.*, 45: 392-395 (1934); *C.A.*, 28: 4662. SpVi

WOOD, R. W. (Continued)

- (W-89) Raman spectrum of heavy water vapor. *Phys. Rev.*, 45: 732-733 (1934); *C.A.*, 28: 4662. SpVi
- (W-90) Raman spectrum of benzene-d₆. *J. Chem. Phys.*, 3: 444-445 (1935); *C.A.*, 29: 6505. SpVi
- (W-91) Raman spectrum of heavy benzene. *Phys. Rev.*, 48: 488 (1935); *C.A.*, 31: 5676. SpVi
- (W-92) Arc spectra of hydrogen and deuterium. An abstract. *Science*, 81: 465 (1935). SpEl
- (W-93) Raman spectrum of deuterioacetaldehyde. *J. Chem. Phys.*, 4: 536 (1936); *C.A.*, 30: 6646. SpVi
- (W-94) Raman spectra of deuterioparaldehyde and paraldehyde. *J. Chem. Phys.*, 5: 287-289 (1937); *C.A.*, 31: 4596. SpVi

See also FRANCK, J.; PRICE, W. C.

WOOD, R. W., and DIEKE, G. H.

- (W-95) The spectrum of the arc in hydrogen. *Phys. Rev.*, 53: 146-152 (1938); *C.A.*, 32: 2024. SpEl

WOOD, R. W., and RANK, D. H.

- (W-96) The Raman spectrum of heavy chloroform. *Phys. Rev.*, 48: 63-65 (1935); *C.A.*, 29: 6840. SpVi

WOODARD, H. Q., and CHESLEY, L. C.

- (W-97) Swelling of gelatin in deuterium oxide. *J. Am. Chem. Soc.*, 56: 2562-2563 (1934); *C.A.*, 29: 4994. BiC

WOODWARD, I.

See UBBELOHDE; A. R.

WOOLDRIDGE, D. E., and SMYTHE, W. R.

- (W-98) The separation of gaseous isotopes by diffusion. *Phys. Rev.*, 50: 233-237 (1936); *C.A.*, 30: 6639. SeDf

WORLEY, F. P.

- (W-99) Heavy-water content of deep-sea water. *Trans. Proc. Roy. Soc. New Zealand*, 66: 97-98 (1936); *C.A.*, 30: 7927. AbG

WU, C. K.

See LEE, E.

WU, T. Y.

- (W-100) The fundamental frequencies of CH_2 , CHD , CD_2 , CHCl , CDCl and cis- and trans- $\text{C}_2\text{H}_2\text{D}_2$ and $\text{C}_2\text{H}_2\text{Cl}_2$. J. Chem. Phys., 5: 392-398 (1937); C.A., 31: 4901. SpVi

WUELFERT, K.

See HANSEN, K.

WYLIE, A. W.

See WILSON, C. L.

WYMAN, Jr., and INGALLS, E. N.

- (W-101) The dielectric constant of deuterium oxide. J. Am. Chem. Soc., 60: 1182-1184 (1938); C.A., 32: 6117. ElD, MeD

WYNNE-JONES, W. F. K.

- (W-102) Acid base reaction involving deuterium. J. Chem. Phys., 2: 381-385 (1934); C.A., 28: 5322. InK, KiL
- (W-103) Mixtures of deuterium and protium oxides as ideal solutions. J. Chem. Phys., 3: 197 (1935); C.A., 29: 2841. ThF
- (W-104) The use of isotopes in acid and basic catalysis. Chem. Revs., 17: 115-123 (1935); C.A., 29: 7773. InKi
- (W-105) Electrolytic dissociation of heavy water. Trans. Faraday Soc., 32: 1397-1402 (1936); C.A., 31: 23. EqI

See also TOPLEY, B.

YAMAMOTO, R.

See TERADA, T.

YAMASAKI, K.

- (Y-1) Catalytic oxidation action of complex metal compounds. XI.
Catalytic oxidation in heavy water. Bull. Chem. Soc.
Japan, 11: 431-433 (1936); C.A., 30: 7019. KiL

YOSHIMURA, K. (YOSIMURA, K)

See ISHIKAWA, H.

YOSHIOKA, K. (YOSIOKA, K.)

- (Y-2) Sound velocity in heavy water and compressibility. Sci.
Papers Inst. Phys. Chem. Research Tokyo, 34: 843-853
(1938); C.A., 32: 8229. MeAc, MeD

YOSIDA, T.

See also TITANI, T.

YOSIDA, T., and TITANI, T.

- (Y-3) Polymerization of styrene in heavy alcohol. A contribution
to the mechanism of the chain polymerization of styrene
in solutions. Bull. Chem. Soc. Japan, 16: 125-136 (1941);
C.A., 35: 5375. InKi

YOST, D. M.

See ANDERSON, T. F.

YOUNG, A. R.

- (Y-4) Bibliography of deuterium (as of August 1, 1934). Penn.
State College, State College, Penn., C.A., 28: 7168. Ge

YOUNG, H. A.

See LATIMER, W. M.

YOUNG, L. E., and PORTER, C. W.

- (Y-5) Stereochemistry of deuterium compounds. I. Optical rota-

YOUNG, L. E., and PORTER, C. W. (Continued)

tion of methylhexyldeuterocarbinol. J. Am. Chem. Soc.,
59: 328-329 (1937); C.A., 31: 1759. ElRo, Sy

(Y-6) Stereochemistry of deuterium compounds. II. α -Methylben-
zylamine. J. Am. Chem. Soc., 59: 1437-1438 (1937); C.A.,
31: 6635. ElRo

YUDKIN, J.

See FARKAS, A.; HUGHES, A. H.

YUSTER, S.

See REA, C. E.; REYERSON, L. H.

ZACHARIAS, J. R.

See KELLOGG, J. M. B.; RABI, I. I.

ZANETTI, J. E., and SICKMAN, D. V.

- (Z-1) Synthesis of deuterioacetaldehyde. *J. Am. Chem. Soc.*, 57: 2735 (1935); *C.A.*, 30: 1737. Sy, ThPh
- (Z-2) Deuterioacetaldehyde (acetaldehyde- d_4). *J. Am. Chem. Soc.*, 58: 2034-2035 (1936); *C.A.*, 31: 1763. Sy, ThPh

ZAN'KO, A. A.

See also BRODSKII, A. I.

ZAN'KO, A. A., and BRODSKII, A. I.

- (Z-3) The absorption spectra of copper, cobalt and nickel sulfates in heavy water. *Acta. Physicochim. U.R.S.S.*, 8: 309-314 (1938); *C.A.*, 33: 2802. ElCl

ZAN'KO, A. A., and SATUNOVSKII, Y. A.

- (Z-4) Temperature dependence of the absorption of light by solutions of copper sulfate in heavy water. *J. Phys. Chem. U.S.S.R.*, 13: 1509-1511 (1939); *C.A.*, 35: 384. ElCl

ZAPF, G.

See SIEVERTS, A.

ZEEMAN, P., and GIER, J. de

- (Z-5) Experiments concerning isotopes of some of the noble gases and hydrogen by means of J. J. Thomson's mass spectrograph. *Proc. Koninkl. Nederland. Akad. Wetenschap.*, 36: 609-611 (1933); *C.A.*, 27: 5636. AnMs
- (Z-6) Second preliminary note on some experiments concerning the isotope of H. *Proc. Koninkl. Nederland. Akad. Wetenschap.*, 36: 716-717 (1933); *C.A.*, 28: 5340. AnMs
- (Z-7) Third preliminary note on some experiments concerning the isotope of hydrogen. *Proc. Koninkl. Nederland. Akad. Wetenschap.*, 37: 2-3 (1934); *C.A.*, 28: 3299. AnMs

ZENTNER, J.

See REDLICH, O.

ZICKLER, H.

See KLAR, R.

ZIEGLER, W. T., and ANDREWS, D. H.

- (Z-8) The heat capacity of benzene-d₆. J. Am. Chem. Soc., 64: 2482-2485 (1942); C.A., 36: 6854. ThF, ThPh

ZINTL, E., and HARDER, A.

- (Z-9) Lattice dimensions of lithium hydride, LiH, and lithium deuteride, LiD. Z. physik. Chem., B28: 478-480 (1935); C.A., 29: 5325. CrX

ZIRPOLO, G.

- (Z-10) Heavy water in biology. Riv. fis. mat. e sci. nat., 11: 372-377, 406-414 (1937); Chem. Zentr., II: 4357 (1937); C.A., 33: 6363. Bi
- (Z-11) The effect of heavy water on organisms. II. Experiments with *Nausithoe punctata*. Boll. soc. nat. Napoli, 49: 123-128 (1938); C.A., 34: 6953. Bi
- (Z-12) The effect of heavy water on organisms. I. Boll. soc. nat. Napoli, 49: 137-146 (1938); C.A., 34: 6952. Bi
- (Z-13) The effect of heavy water on organisms. Riv. fis., mat. e sci. nat., 13: 367-370 (1939). Chem. Zentr., I: 1040 (1940); C.A., 35: 6993. Bi
- (Z-14) The effect of heavy water on organisms. V. Experiments with the polychete annelid *Nereis dumerilli*. Boll. soc. nat. Napoli, 50: 33-39 (1940); C.A., 36: 4139. Bi
- (Z-15) The effect of heavy water on organisms. VI. Experiments with *Capitella capitata*. Boll. soc. nat. Napoli, 50: 41-48 (1940); C.A., 36: 4139. Bi
- (Z-16) Effect of heavy water on organisms. VIII. Studies with the gastropod mollusks *Bittium scabrum* Olivi and *Phyllirhoe buscephala* Peron and Lesseur and with pteropod mollusks *Creseis acicula* Rang and *Cleodora pyramidata* L. Boll. soc. nat. Napoli, 51: 3-15 (1940); C.A., 37: 3185. Bi
- (Z-17) Effects of heavy water on organisms. IX. Experiments on Ostracods; *Cypris fusca* Str. Riv. fis., mat. e sci. nat., 17: 36-37 (1942); C.A., 39: 313. Bi

ZWEIG, M. J.

- (Z-18) The use of isotopes as indicators of reaction mechanism.

ZWEIG, M. J. (Continued)

Rev. col. farm. nacl. Rosario, Arg. 1940: 172-180, 236-242
(1940); C.A., 37: 576. InKi

ZWICKER, B.

See also QUERVAIN, M. de

ZWICKER, B., and SCHERRER, P.

(Z-19) Electro-optical behavior of KD_2PO_4 and KH_2PO_4 crystals.
Helv. Phys. Acta, 16: 214-216 (1943); C.A., 38: 5444. EID

ZYW, M.

See HERSZFINKIEL, H.

Section 2

SUBJECT INDEX

The following subject index has been arranged according to a series of principal topics indicated by two letters, for example, Chemical Kinetics, Ki. Subdivisions are given one or more additional letters, as Photochemical Kinetics, KiP. Under each topic, references are given to Section 1 of the Bibliography by letter-number combinations as S-100, meaning reference 100 under letter S. The letter, of course, indicates the name of the paper's senior author.

When a paper deals with more than one subject, this method of cross-indexing permits reference to be made to it under each appropriate subject heading.

- Ab** ABUNDANCE OF DEUTERIUM
A-66, C-26, C-27, R-77, R-81, S-169, U-20, U-21, U-22
- AbG** Geological (Including Petroleum)
A-18, A-45, B-14, B-59, B-60, B-61, B-62, B-63, B-121, B-151, B-198, B-242, B-243, B-245, C-16, C-48, D-20, D-40, D-41, D-42, E-7, E-19, E-20, E-74, E-75, F-61, F-62, G-1, G-25, G-26, G-49, G-56, G-57, H-20, H-40, H-41, H-45, H-47, H-48, I-20, J-16, J-17, K-17, L-30, L-61, M-11, M-17, M-18, M-29, M-62, M-109, M-110, M-112, N-9, O-9, O-11, P-6, P-7, P-45, P-49, R-4, R-72, R-73, R-76, R-78, R-79, R-80, R-96, S-31, S-52, S-62, S-73, S-85, S-110, T-12, T-29, T-35, T-36, T-37, T-65, T-66, V-12, V-15, V-16, W-20, W-64, W-99
- AbO** Organic
B-224, D-40, D-41, D-42, D-43, D-44, D-45, E-33, E-34, E-40, G-56, K-21, M-2, M-81, O-10, O-31, P-49, R-73, S-6, S-98, S-148, S-160, T-61, T-62, W-19, W-20
- Ad** ADSORPTION AND SORPTION
- AdG** Gases on Solids
A-58, B-64, B-67, B-91, B-92, B-93, B-157, B-190, B-235, B-271, B-272, D-32, D-33, E-11, G-28, H-157,

- Ad** **ADSORPTION AND SORPTION (Continued)**
- AdG** **Gases on Solids (Continued)**
 I-1, I-30, I-36, I-52, I-53, K-5, K-39, K-40, K-54, K-55,
 K-56, K-62, K-68, L-48, M-16, M-20, M-21, M-42,
 M-60, M-61, M-105, P-1, P-58, S-97, S-112, S-158,
 S-159, T-20, T-44, U-2, W-39
- AdL** **Liquids on Solids**
 K-43
- An** **ANALYTICAL METHODS**
 F-58, F-65, H-36, H-40, H-64, I-20, M-96, M-112
- AnDn** **Density Methods**
 A-31, B-68, B-242, B-245, D-41, D-43, D-45, E-19,
 E-20, E-40, F-55, F-63, F-119, G-1, G-25, G-27, G-37,
 G-49, G-57, H-19, H-43, I-55, K-34, L-78, M-113,
 M-114, O-18, P-44, P-45, R-109, S-52, T-79, T-85,
 U-37, V-16, W-20, W-21
- AnEl** **Optical Rotation**
 C-62
- AnMg** **Magnetooptic Methods**
 A-20, L-35
- AnMs** **Mass Spectrograph**
 B-147, B-148, B-149, B-150, B-152, B-158, C-118, G-51,
 K-8, L-70, L-93, L-99, L-100, L-101, M-125, T-10,
 T-47, Z-5, Z-6, Z-7
- AnRf** **Refractive Index**
 C-123, C-124, F-63, F-64, H-19, H-20, J-34, K-34, L-60
- AnTh** **Thermal Conduction**
 B-166, B-167, B-269, B-270, E-6, E-14, F-6, F-15,
 F-35, G-64, N-12, S-1, S-97, T-78, T-99, W-10, W-69
- Bi** **BIOLOGICAL EFFECTS OF HEAVY WATER**
 A-50, A-52, B-49, B-158, B-199, B-206, B-207, B-225,
 C-26, C-136, E-45, H-34, H-66, H-100, H-108, I-8, L-74,
 R-25, R-49, T-3, T-12, T-30, T-31, T-43, U-14, V-17,
 Z-10, Z-11, Z-12, Z-13, Z-14, Z-15, Z-16, Z-17
- BiB** **Botanical**
 B-48, B-260, C-17, C-108, C-131, C-132, D-55, E-81,
 F-70, G-9, G-48, G-74, G-75, H-35, H-68, H-158, I-33,
 K-51, K-57, K-169, L-34, L-51, L-52, L-82, M-10, M-50,
 M-64, M-65, M-66, M-81, M-82, P-51, P-61, P-63, P-64,
 P-66, R-50, R-51, R-59, R-60, R-61, R-62, S-6, S-72,
 T-11, T-63, W-32

- Bi** **BIOLOGICAL EFFECTS OF HEAVY WATER (Continued)**
- BiC** **Biochemical**
 B-28, B-32, B-114, B-116, B-163, B-170, B-180, B-208,
 B-210, B-211, C-3, C-4, C-5, F-82, F-92, F-93, F-98,
 G-48, H-158, J-2, J-3, J-4, M-8, M-9, M-131, P-36,
 P-37, P-38, P-39, P-40, P-41, R-40, T-49, W-97
- BiZ** **Zoological**
 A-46, A-48, B-20, B-21, B-22, B-23, B-24, B-25, B-26,
 B-27, B-29, B-30, B-31, B-33, B-34, B-35, B-45, B-46,
 B-47, B-50, B-51, B-52, B-53, B-55, B-56, B-57, B-58,
 B-160, B-161, B-162, B-171, B-209, B-212, B-251,
 B-252, C-63, D-15, D-48, D-58, D-62, E-62, F-83, F-91,
 F-94, G-5, G-48, G-75, H-3, H-38, H-39, H-42, H-90,
 H-91, H-101, H-102, H-105, K-99, L-52, L-95, M-10,
 N-5, P-5, P-52, P-62, R-26, R-113, S-29, S-30, S-68,
 S-102, S-145, S-163, T-42, U-31, W-81
- Cr** **CRYSTAL STRUCTURE**
 R-93, R-94, S-17, T-69, U-2
- CrX** **X-ray Diffraction**
 M-44, S-147, T-90, U-4, U-5, U-6, U-7, V-8, V-9, V-10,
 Z-9
- Ec** **ELECTROCHEMICAL PROPERTIES**
- EcC** **Conductivities and Mobilities**
 A-5, B-13, B-108, B-109, C-10, C-25, C-47, F-66, F-67,
 F-90, F-113, I-7, I-10, L-8, L-14, L-56, L-69, L-88,
 R-104, R-105, R-106, R-107, S-77, S-79, T-41, T-89,
 U-2, W-14
- EcO** **Overvoltage**
 B-194, C-6, C-8, H-110, H-111, H-112, H-113, H-114,
 H-126, H-141, H-144, N-33, V-1
- EcP** **Electrode Potentials**
 A-4, A-8, B-230, B-231, B-232, F-81, H-24, H-27,
 H-112, H-136, K-91, L-5, L-12, M-128, N-26, R-116,
 S-50, S-51, U-28
- Ed** **ELECTRON DIFFRACTION**
 K-16
- EI** **ELECTROMAGNETIC AND OPTICAL PROPERTIES (EX-
 CEPT SPECTRA)**
 A-48, B-225

EI **ELECTROMAGNETIC AND OPTICAL PROPERTIES**
(EXCEPT SPECTRA) (Continued)**EICl** Color Effects

B-94, B-248, D-54, F-59, K-1, K-15, K-88, K-89, M-32,
M-36, R-108, Z-3, Z-4

EID Dielectric Constants and Dipole Moments

A-1, B-19, B-100, B-102, B-142, B-249, B-265, C-18,
C-19, D-36, D-37, G-71, H-2, H-129, H-130, I-15, I-49,
K-24, K-25, K-26, L-65, M-48, M-127, Q-1, T-1, T-50,
W-101, Z-19

EIGd Gas Discharges

G-70, G-79, G-80, G-81, J-25, J-26, L-39, P-26, R-65,
S-138, T-103

EIMg Magnetic Susceptibility

C-1, C-2, F-117, G-54, H-2, H-121, I-32, N-7, O-20,
R-5, R-6, S-59, S-79, S-120, T-81, T-82, W-79, W-80

ElMr Magnetic Rotatory Power

D-59, D-60, F-57, G-2, H-6, O-19, S-89

Elrf Refractive Index

B-87, B-88, B-201, B-222, C-13, C-26, C-133, C-134,
E-48, F-111, F-114, F-115, F-116, I-15, L-60, L-103,
M-13, M-39, M-111, O-19, O-32, O-33, R-30, R-92,
S-59, S-142, S-152, T-29, T-52, T-88, T-91, W-21, W-42

ElRo Optical Rotatory Power

A-11, A-14, B-136, B-137, B-266, B-267, B-274, C-58,
C-59, C-61, C-62, C-106, D-61, E-26, E-31, E-42,
E-49, E-50, E-51, E-52, F-106, G-67, H-30, H-31, I-60,
J-13, L-40, L-41, M-7, O-8, O-20, P-2, P-4, R-43, Y-5,
Y-6

ElSc Light Scattering

B-130, B-135, C-12, L-31, L-32, L-33

Eq **CHEMICAL EQUILIBRIA**

I-55, S-162

EqG Gaseous

A-8, A-48, B-225, B-271, B-272, C-67, C-102, C-122,
C-126, F-7, F-19, G-12, G-32, G-51, G-53, G-64, H-22,
H-120, I-29, J-24, J-32, J-48, M-57, M-136, P-12, R-55,
R-81, R-90, S-134, S-136, S-139, T-27, T-70, T-80, U-3,
U-28, W-65, W-66, W-67, W-68

EqH Heterogeneous

A-8, B-65, B-145, B-169, B-199, B-225, B-276, C-26,
C-27, C-30, C-31, C-117, C-119, C-120, C-121, C-122,

- Eq CHEMICAL EQUILIBRIA (Continued)
- EqH Heterogeneous (Continued)
- F-6, F-12, F-13, F-16, F-17, F-18, F-27, F-40, F-47,
F-76, G-1, G-11, G-50, G-53, H-5, H-12, H-120, H-138,
H-139, H-140, H-145, H-146, I-2, I-29, J-20, J-32, K-14,
K-31, K-55, K-90, K-91, L-71, M-78, M-105, O-7, O-14,
O-23, P-9, P-10, R-53, R-54, R-55, R-56, R-58, R-83,
R-89, R-90, S-74, S-94, T-19, T-20, T-26, T-28, T-70,
T-73, T-90, T-100, U-3, W-37, W-38
- EqI Ionic
- A-3, A-4, A-5, C-129, C-130, D-17, D-18, D-53, E-28,
E-29, E-35, E-59, G-35, G-41, G-63, H-23, H-27, K-44,
K-91, L-7, L-8, L-12, L-13, L-68, L-69, M-80, O-7,
O-36, R-116, S-49, S-50, S-51, T-74, W-105
- EqL Liquid and Solution
- A-3, A-7, A-8, A-9, A-10, A-27, B-104, B-177, B-199,
B-219, B-225, B-236, B-237, B-244, B-247, B-256,
B-257, B-258, C-20, C-47, D-3, E-36, E-37, E-43,
E-57, E-63, E-77, F-16, F-50, F-79, G-8, G-9, G-26,
G-67, H-12, H-14, H-15, H-17, H-28, H-29, H-44, H-49,
H-51, H-52, H-124, H-142, I-10, I-12, I-13, I-14, I-19,
I-56, I-57, I-58, I-59, J-5, J-47, K-2, K-3, K-37, K-44,
K-52, K-60, K-69, K-70, K-71, K-72, K-73, K-74, K-75,
K-76, K-78, K-79, K-80, K-81, K-82, K-83, K-91, K-93,
K-94, L-5, L-11, L-12, L-66, M-35, M-37, M-78, N-1,
O-3, O-4, O-5, O-6, O-12, O-13, O-15, O-17, O-21,
O-22, O-34, O-36, R-17, R-23, R-40, R-41, R-48, R-55,
R-87, R-116, S-2, S-44, S-48, S-67, S-92, S-93, S-95,
S-96, S-143, T-9, T-12, T-45, T-73, W-8, W-33, W-71,
W-72
- EqQ Qualitative (Observations)
- A-1, B-99, B-164, B-169, B-174, B-179, C-63, E-53,
F-34, G-74, H-14, H-18, H-22, H-26, H-44, H-49, H-51,
H-138, L-50, L-80, M-5, M-99, M-129, M-130, M-132,
M-142, O-2, R-91, W-77
- Ge GENERAL AND REVIEW
- A-46, A-47, A-53, A-63, B-16, B-83, B-168, B-187,
B-193, B-202, B-268, C-28, C-46, C-50, C-54, C-107,
D-6, D-7, D-8, D-10, D-46, D-47, E-9, F-5, F-38, F-74,
F-75, F-89, F-107, F-108, G-55, G-62, H-1, H-9, H-10,
H-11, H-56, H-63, H-65, H-163, I-9, J-18, J-33, K-9,
K-13, K-33, K-38, L-16, L-46, L-53, L-79, L-92, L-96,

- Ge GENERAL AND REVIEW (Continued)
 L-97, M-19, M-30, M-31, M-40, M-41, M-73, O-29,
 O-42, P-21, P-56, P-57, P-73, R-39, R-66, R-67, R-68,
 R-114, R-117, R-118, R-119, R-120, R-121, R-122, S-57,
 S-58, S-118, S-141, S-151, S-162, T-13, T-14, T-17,
 T-32, T-39, T-47, U-10, U-12, U-13, U-14, U-15, U-25,
 U-29, V-7, V-11, W-4, W-15, W-16, W-70, Y-4
- In DEUTERIUM AS AN INDICATOR OR TRACER
 B-225, R-110
- InBi Biological
 A-28, B-68, B-115, B-116, B-117, B-118, B-119, B-120,
 B-153, B-171, B-176, C-21, C-92, C-104, E-21, F-36,
 F-54, F-83, H-8, H-46, H-103, H-104, H-106, H-108,
 K-98, K-100, P-46, P-47, P-62, R-24, R-82, R-84, R-85,
 R-86, R-87, R-88, R-111, S-29, S-33, S-35, S-36, S-37,
 S-38, S-39, S-40, S-41, S-42, S-43, S-64, S-86, S-103,
 S-116, S-122, S-144, U-32, U-33, U-34, U-35, U-36, V-20,
 W-1, W-2, W-33
- InKi Reaction Kinetics
 A-34, B-18, B-86, B-171, B-175, B-181, E-30, E-56,
 F-23, F-29, F-36, F-82, F-102, G-67, H-127, H-136,
 H-138, H-146, H-147, H-152, H-153, I-16, I-19, I-56,
 I-58, I-59, I-60, J-7, J-12, J-32, J-42, J-47, K-49, M-55,
 M-63, M-105, M-116, N-10, O-21, O-22, R-40, R-44,
 R-102, S-34, S-43, S-133, S-134, S-135, T-9, T-16, T-25,
 T-59, T-101, T-102, V-18, W-7, W-53, W-102, W-104,
 Y-3, Z-18
- InSt Structure Determination
 E-30, E-54, E-55, E-64, E-65, G-42, G-43, G-44, I-17,
 L-25, M-55, O-25, S-95, S-132, T-8
- Ki CHEMICAL KINETICS
 P-56, R-102, S-162
- KiB Biochemical
 A-35, B-54, B-56, B-170, B-180, B-210, B-211, B-250,
 C-3, E-60, F-36, J-3, J-4, M-8, M-9, P-36, P-37, P-38,
 P-39, P-40, S-5, S-117, S-128, S-129, V-18
- KiG Gaseous
 A-22, B-1, B-84, B-98, B-146, B-169, B-173, B-273,
 C-82, D-4, D-12, E-79, E-80, F-7, F-8, F-19, F-20,
 F-31, F-32, F-33, F-39, F-41, F-43, F-48, F-120, G-7,
 G-12, G-46, G-64, H-116, H-118, H-121, J-32, J-42,

- Ki** CHEMICAL KINETICS (Continued)
- KiG** Gaseous (Continued)
 K-18, K-41, L-48, L-86, M-51, M-52, M-57, M-84,
 M-95, M-100, P-32, P-35, P-55, R-103, S-75, S-104,
 S-130, S-131, S-136, S-139, S-157, T-80
- KiH** Heterogeneous
 A-34, B-86, B-191, C-6, C-7, C-8, C-60, E-11, E-12,
 E-13, E-58, E-76, F-4, F-9, F-11, F-21, F-22, F-24,
 F-26, F-27, F-28, F-29, F-42, F-45, F-46, F-98, G-7,
 G-10, G-11, G-12, G-24, G-58, H-117, H-118, H-119,
 H-143, I-31, J-20, J-32, J-36, J-37, J-44, K-31, K-53,
 K-55, K-56, M-53, M-63, M-83, M-101, M-102, M-103,
 M-105, O-14, O-24, P-58, S-97, S-127, T-20, T-96, T-97,
 T-98, T-100, T-101, T-102, U-8, U-27, W-40
- KiI** Ionic
 B-172, O-16, O-34
- KiL** Liquid and Solution
 A-2, A-6, A-29, A-30, A-32, B-165, B-169, B-178,
 B-181, B-215, B-216, B-217, B-219, B-220, C-32, C-37,
 C-90, F-30, F-102, F-103, G-4, G-6, G-65, G-66, G-67,
 G-68, H-15, H-30, H-31, H-32, H-33, H-50, H-125,
 H-148, H-150, H-151, H-156, I-16, I-56, I-57, I-60, J-5,
 J-41, K-2, K-3, K-4, K-69, K-74, K-75, K-77, K-78,
 K-79, K-80, K-82, K-83, L-10, L-81, L-83, L-98, M-33,
 M-34, M-35, M-90, M-91, M-92, N-1, N-8, O-6, O-34,
 O-36, P-2, P-3, P-4, R-40, R-41, R-42, R-43, R-44,
 R-45, R-46, R-47, R-48, R-52, S-4, S-45, S-46, S-105,
 S-126, S-168, T-68, W-8, W-9, W-58, W-73, W-102, Y-1
- KiP** Photochemical
 C-89, C-103, C-108, C-127, C-132, F-37, H-89, J-43,
 J-45, J-46, L-42, M-51, M-53, M-54, M-56, M-58, M-59,
 M-97, M-98, M-104, P-65, P-66, S-100, S-134, S-136,
 T-25
- KiR** Radiochemical
 J-40, L-75, L-76, L-77, M-134
- Me** MECHANICAL PROPERTIES
 A-46, A-48, B-140, B-195, B-223, B-225
- MeAc** Acoustic Properties
 B-2, E-72, I-37, I-40, I-42, I-43, I-50, I-51, I-54, R-63,
 Y-2
- MeD** Density, Compressibility, and Thermal Expansion
 A-11, B-68, B-69, B-134, B-135, B-201, B-222, C-26,

- Me** **MECHANICAL PROPERTIES (Continued)**
MeD Density, Compressibility, and Thermal
 Expansion (Continued)
 C-32, C-34, C-35, C-48, C-56, C-66, C-81, C-105,
 C-134, E-48, F-52, H-126, H-130, H-151, I-6, I-15, I-16,
 I-59, J-19, J-28, J-43, K-3, K-60, K-105, L-62, L-78,
 L-87, L-94, L-103, M-13, M-45, M-46, M-68, M-75,
 M-111, M-117, P-29, R-30, R-48, R-95, R-104, R-115,
 S-23, S-24, S-25, S-32, S-59, S-107, S-108, S-120, S-142,
 S-156, S-170, S-171, T-2, T-12, T-24, T-29, T-55, T-69,
 T-87, T-88, T-89, T-90, T-91, U-1, W-21, W-37, W-74,
 W-75, W-101, Y-2
- MeDf** Diffusion
 C-118, D-35, E-72, F-13, F-68, F-69, F-99, F-100,
 F-101, G-76, G-77, G-81, H-61, H-70, I-41, J-29, J-30,
 J-31, J-37, J-38, J-39, L-84, M-38, M-61, M-115, O-35,
 O-37, R-101, S-164, S-168, T-40, W-82
- MeSt** Surface Tension
 B-105, C-94, D-32, F-72, H-53, I-6, I-34, J-28, L-1,
 L-2, S-59, T-1, T-4, T-53, T-86
- MeV** Viscosity
 A-21, A-23, B-12, B-13, B-221, B-234, C-10, C-47,
 H-25, I-35, I-38, I-39, I-44, I-45, I-46, I-47, I-48, J-27,
 L-44, L-63, L-94, R-104, R-105, S-59, T-29, T-75, V-2,
 V-4, W-40
- No** **NOMENCLATURE**
 A-51, A-59, A-60, B-192, B-199, C-26, C-109, F-60,
 G-47, H-55, M-133, S-76, U-23, U-24, U-26, V-19, W-26,
 W-41
- Nu** **NUCLEAR PROPERTIES OF DEUTERIUM**
NuM Masses and Binding Energies
 A-65, A-67, B-7, B-8, B-9, B-10, B-11, B-123, B-124,
 B-156, B-203, E-10, F-49, F-73, G-52, H-166, K-106,
 M-93, M-119, P-50, R-3, S-115, W-78
- NuMg** Magnetic Moments
 C-14, C-49, E-67, E-68, E-69, F-20, F-41, F-43, F-73,
 K-6, K-23, K-24, K-25, K-26, K-27, K-28, K-29, K-30,
 K-106, M-1, M-94, N-27, R-1, R-2, R-6, S-71, W-78
- NuR** Reactions
 B-213, B-214, H-60, H-92, J-14, K-7, L-3, L-4, R-3,
 S-71

- Nu** **NUCLEAR PROPERTIES OF DEUTERIUM (Continued)**
- NuS** Spins
 A-46, C-67, C-68, C-72, K-7, L-54, M-137, M-138,
 M-139, S-61, T-21
- NuSt** Statistics
 S-61, T-21
- Se** **SEPARATION**
 A-46, A-49, B-204, B-239, C-27, D-5, D-9, I-20, L-102,
 M-110, P-73, S-20, U-9, U-18, W-23
- SeAd** Adsorption and Desorption
 E-82, E-83, G-51, K-10, K-68, P-48, S-78, T-23, W-18,
 W-21
- SeCf** Centrifuging
 B-89, W-62
- SeCh** Chemical Reaction
 C-83, C-84, D-11, F-14, F-16, F-25, H-149, H-159,
 H-160, J-20, P-13, P-14, P-18, P-23, R-57, R-64, S-113,
 U-16, U-17, U-25
- SeCr** Crystallization
 B-261, B-262, B-263, D-23, E-75, G-26, G-78, M-4,
 R-71, T-38
- SeDf** Diffusion (Including Thermal)
 A-15, B-36, B-37, B-85, B-139, B-158, B-205, B-238,
 B-264, C-26, C-79, C-80, C-85, F-68, F-69, F-110,
 F-126, G-51, G-59, G-60, H-58, H-69, H-70, H-77, H-93,
 H-94, J-29, J-31, K-92, K-95, L-24, L-84, M-3, M-6,
 M-135, O-30, P-22, S-56, U-11, U-16, W-5, W-6, W-34,
 W-76, W-98
- SeDs** Distillation
 C-16, C-96, H-19, H-46, H-140, H-161, J-8, K-19, K-20,
 L-55, P-25, R-8, S-161, T-60, T-95, U-16, U-17, U-21,
 W-3, W-17, W-18, W-21, W-44
- SeEl** Electrolysis
 A-16, A-17, A-33, A-48, A-54, A-55, A-61, A-64, A-66,
 B-97, B-103, B-158, B-194, B-199, B-240, B-241, B-246,
 B-255, B-276, C-16, C-24, C-26, C-45, C-100, E-8,
 E-32, E-38, E-39, E-71, E-82, E-83, F-10, F-88, F-110,
 G-38, H-24, H-57, H-62, H-135, H-141, H-167, J-16,
 J-17, J-23, K-10, L-49, L-61, N-11, N-12, N-24, N-25,
 O-14, O-16, O-38, O-39, P-15, P-16, P-17, P-19, P-20,
 P-24, P-27, P-28, P-54, R-10, S-18, S-47, S-60, S-88,
 T-21, T-22, T-64, T-67, T-71, T-72, T-73, T-83, T-84,

- Se SEPARATION (Continued)
SeEl Electrolysis (Continued)
T-85, U-30, W-11, W-12, W-13, W-21, W-23, W-24,
W-25, W-31
SeEm Electroendosmosis
T-50
SeMs Mass Spectrometer
A-19, A-65, A-66, K-96, U-16
- So SOLUBILITY
B-225, T-1
SoG Gases in Solids
S-77, S-78, S-80, S-81, S-82, S-83
SoH In H₂O, HDO and D₂O
A-7, A-48, B-231, B-266, C-10, C-32, C-36, C-128, E-2,
E-3, E-29, E-47, H-76, K-91, L-18, M-76, M-78, N-1,
P-30, P-59, S-66, T-18, T-56, T-57, V-14
SoO In Organic Solvents
E-35
- Sp SPECTRA AND SPECTROSCOPIC CONSTANTS
S-119, U-21
SpA Atomic (Line) of Hydrogen and Deuterium
B-15, B-141, B-158, C-38, C-39, C-40, C-41, D-34,
D-51, D-52, G-21, G-22, G-23, H-7, H-59, H-107, H-154,
K-86, N-2, N-3, N-4, P-11, R-9, R-21, R-65, R-97, S-3,
S-63, S-121, S-146, T-76, U-19, W-47, W-48, W-49,
W-50, W-51, W-52
SpEl Molecular Electronic
B-90, B-106, B-125, B-127, B-128, B-129, C-22, C-23,
C-52, C-111, C-112, C-113, C-114, C-115, C-116, D-24,
D-25, D-26, D-27, D-28, D-29, D-30, D-31, D-49, D-50,
D-56, D-57, E-22, F-2, F-3, F-77, F-78, F-84, F-85,
F-86, F-87, F-95, F-121, F-122, F-123, F-124, F-125,
G-13, G-14, G-15, G-16, G-17, G-18, G-19, G-20, G-61,
G-72, G-73, H-69, H-71, H-72, H-73, H-74, H-75, H-131,
H-132, H-164, H-165, I-3, I-4, I-5, I-18, I-21, I-22, I-23,
I-24, I-25, I-26, I-27, I-28, J-6, J-9, J-10, J-11, J-13,
J-15, J-21, J-22, J-35, J-43, K-32, K-84, K-85, K-101,
L-36, M-47, M-74, N-6, N-17, N-29, N-30, O-1, O-25,
O-26, O-40, P-33, P-34, P-68, P-69, P-70, P-71, R-19,
R-20, R-21, R-100, S-9, S-10, S-11, S-12, S-13, S-14,

- Sp SPECTRA AND SPECTROSCOPIC CONSTANTS (Continued)
- SpEl Molecular Electronic (Continued)
 S-15, S-16, S-19, S-32, S-65, S-70, S-124, S-125, T-24,
 T-77, W-27, W-28, W-29, W-30, W-92, W-95
- SpFl Fluorescence
 C-135, I-17, S-125, W-57
- SpVi Vibrational (Including Raman)
 A-12, A-13, A-24, A-25, A-26, A-27, A-36, A-37, A-38,
 A-39, A-40, A-41, A-42, A-43, A-44, A-62, B-3, B-4,
 B-5, B-6, B-17, B-38, B-39, B-40, B-41, B-42, B-43,
 B-44, B-70, B-71, B-72, B-76, B-77, B-78, B-79, B-80,
 B-81, B-82, B-107, B-111, B-112, B-113, B-131, B-132,
 B-133, B-182, B-183, B-184, B-185, B-186, B-189,
 B-196, B-197, B-222, B-259, B-275, C-9, C-11, C-12,
 C-13, C-15, C-29, C-42, C-43, C-51, C-93, C-99, C-101,
 C-102, C-110, C-125, D-1, D-2, D-14, D-16, D-19, D-21,
 E-1, E-4, E-5, E-15, E-16, E-17, E-18, E-22, E-23,
 E-24, E-66, E-70, E-78, F-40, F-50, F-51, F-53, F-80,
 F-127, G-3, G-18, G-29, G-30, G-31, G-32, G-33, G-39,
 G-40, G-41, G-42, G-43, G-44, G-45, G-82, H-16, H-54,
 H-78, H-79, H-80, H-81, H-82, H-83, H-84, H-85, H-86,
 H-87, H-88, H-95, H-96, H-97, H-98, H-99, H-124,
 H-128, H-131, H-133, H-134, H-155, H-162, I-11, K-22,
 K-35, K-36, K-42, K-59, K-61, K-64, K-65, K-66, K-67,
 L-18, L-25, L-26, L-28, L-29, L-37, L-38, L-43, L-71,
 L-89, L-91, M-12, M-14, M-15, M-22, M-23, M-24,
 M-25, M-26, M-27, M-28, M-70, M-71, M-72, M-79,
 M-85, M-86, M-87, M-88, M-89, M-95, M-106, M-107,
 M-108, M-120, M-121, M-122, M-123, M-124, M-140,
 M-141, M-142, N-13, N-14, N-15, N-16, N-22, N-23,
 N-31, O-27, O-28, O-40, O-41, P-53, P-60, P-72, R-7,
 R-11, R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-22,
 R-27, R-28, R-29, R-30, R-31, R-32, R-33, R-34, R-35,
 R-36, R-37, R-100, S-7, S-8, S-69, S-84, S-87, S-90,
 S-91, S-101, S-111, S-123, S-149, S-150, S-165, S-166,
 S-167, T-33, T-34, T-48, T-91, T-92, T-93, T-94, V-5,
 V-6, V-13, W-42, W-43, W-45, W-46, W-54, W-60, W-61,
 W-63, W-83, W-84, W-85, W-86, W-87, W-88, W-89,
 W-90, W-91, W-93, W-94, W-96, W-100
- SpX X-ray
 F-118, M-43

- Sy** **SYNTHESIS AND PREPARATION OF COMPOUNDS**
 A-14, A-27, A-44, A-48, B-17, B-19, B-102, B-116, B-122, B-126, B-154, B-155, B-183, B-184, B-186, B-195, B-197, B-199, B-200, B-201, B-222, B-223, B-259, B-265, B-274, C-32, C-43, C-55, C-57, C-58, C-60, C-63, C-92, D-1, D-19, E-18, E-24, E-25, E-27, E-31, E-41, E-44, E-45, E-46, E-47, E-48, E-49, E-50, E-56, E-58, E-59, E-61, F-30, F-47, F-50, F-52, F-78, F-80, F-98, F-112, F-114, G-35, H-2, H-4, H-5, H-13, H-37, H-79, H-80, H-81, H-83, H-88, H-89, H-96, H-109, H-118, H-126, H-127, H-137, I-15, I-16, I-60, J-36, J-45, K-37, K-43, K-46, K-49, K-58, K-59, K-60, K-63, K-104, L-27, L-37, L-38, L-40, L-41, L-76, M-13, M-15, M-33, M-79, M-88, M-89, M-95, M-103, M-105, M-111, N-14, N-18, N-22, N-23, N-28, O-12, P-31, R-29, R-32, R-34, R-35, R-36, R-37, R-41, R-45, R-88, R-90, R-91, R-94, S-4, S-33, S-36, S-45, S-87, S-107, S-108, S-109, S-113, S-114, S-137, S-139, S-142, S-150, T-45, T-88, T-91, T-93, T-94, U-5, U-6, U-27, U-34, U-36, W-31, W-33, W-35, W-42, W-54, W-55, W-59, W-63, Y-5, Z-1, Z-2
- Th** **THERMODYNAMIC AND RELATED PROPERTIES**
 B-140, B-225
- ThD** **Diffusion and Heat Conduction**
 A-23, A-56, A-57, B-166, B-167, B-233, F-105, K-11, K-12, K-50, L-17, M-67, N-32, S-28, S-113
- ThF** **Thermodynamic Functions for Pure Substances and for Reactions between Them (E, H, F, S, C_p , ΔE , ΔH , etc.)**
 B-19, B-66, B-74, B-75, B-84, B-85, B-101, B-110, B-138, B-143, B-146, B-159, B-218, C-66, C-67, C-68, C-70, C-71, C-72, C-73, C-75, C-76, C-77, C-78, C-88, C-91, C-95, C-98, D-38, E-29, E-70, F-56, F-71, F-96, G-24, G-32, G-35, H-15, H-17, H-123, I-49, I-51, I-54, J-24, J-48, K-15, K-44, K-47, K-48, K-91, L-7, L-15, L-45, L-85, L-90, M-35, M-58, M-69, M-90, M-92, M-118, M-136, N-18, N-19, N-26, O-36, R-56, R-112, R-116, S-26, S-54, S-114, S-157, T-46, T-69, T-80, U-21, U-28, V-3, W-36, W-37, W-103, Z-8
- ThPh** **Phase Equilibria (Melting Points, Boiling Points, Vapor Pressures, etc., Including Heats)**
 A-11, B-69, B-73, B-80, B-81, B-95, B-96, B-116, B-188, B-201, B-222, B-223, B-226, B-227, B-228,

- Th** **THERMODYNAMIC AND RELATED PROPERTIES**
 (Continued)
- ThPh** **Phase Equilibria (Melting Points, Boiling Points, Vapor Pressures, etc., Including Heats) (Continued)**
 B-229, B-233, B-253, B-254, B-265, C-10, C-25, C-26, C-33, C-53, C-64, C-65, C-66, C-69, C-70, C-73, C-74, C-77, C-86, C-87, C-88, C-91, C-97, C-98, D-13, D-22, D-38, E-3, E-18, E-27, E-29, E-35, E-36, E-44, E-47, E-48, E-70, E-73, E-74, F-1, F-96, F-97, F-104, F-109, G-34, G-69, H-13, H-21, H-109, H-115, H-124, I-15, J-1, J-43, K-46, K-60, K-87, K-102, K-103, K-104, K-105, L-6, K-9, L-18, L-23, L-41, L-47, L-55, L-57, L-58, L-59, L-62, L-64, L-66, L-67, L-72, L-85, M-4, M-13, M-49, M-75, M-76, M-77, M-78, M-111, M-126, N-20, N-21, P-8, P-43, R-14, R-38, R-69, R-70, R-74, R-75, R-93, R-98, R-112, S-21, S-22, S-26, S-27, S-53, S-54, S-55, S-99, S-106, S-107, S-108, S-109, S-113, S-114, S-127, S-137, S-140, S-142, S-152, S-153, S-154, S-155, T-5, T-6, T-7, T-15, T-24, T-29, T-51, T-54, T-55, T-58, T-73, T-90, T-91, U-17, W-3, W-21, W-42, W-55, W-56, Z-1, Z-8
- ThSo** **Properties of Solutions (Heats of Dilution, Vapor Pressures of Solutions, Activities, Fugacities)**
 B-104, B-142, B-143, B-144, B-220, B-232, C-32, C-44, D-38, D-39, L-18, L-19, L-20, L-21, L-22, L-23, L-73, M-48, R-98, R-99

Section 3

COMPOUND INDEX

The following compound index will be useful in finding references for research involving a given compound of deuterium. It is further subdivided by the same code letters used for the subject index. Reference to hexane, for example, will show that deuterated hexanes have been used in electromagnetic, equilibrium, and kinetic studies. The symbol (s) in the first case means that hexane was the solvent. The letter-number combinations, as in the subject index, refer to Section 1. Further details concerning this index will be found in the Introduction to the volume.

A few substances such as organisms, enzymes, glass, etc., which are not chemical compounds in the strict sense of the word, are included here for convenience.

Acenaphthene

EqL K-37

Acetal

EqL B-219

KiL B-216, B-219, H-151, O-36, R-43

Acetaldehyde

EqH H-138

EqL B-225, B-236, K-52

EqQ B-169, H-138

InKi A-34, H-138, M-116

KiL B-181, S-105

SpVi W-93

Sy Z-1, Z-2

ThPh Z-1

Acetamide

EqL B-236, B-237, R-48, S-92, S-93

KiL R-47, R-48

Acetanilide

EqL	S-96
EqQ	E-53
Sy	E-46, E-61

Acetate ion

EqQ	B-164
KiL	B-165

Acetic acid

BiC	B-114
EcC	L-68, L-69
EcO	H-126
Ed	K-16
Eq	I-55
EqI	G-35, H-27, K-91, L-7, L-8, L-68, L-69, S-49, S-51
EqL	B-219, B-225, C-47, D-3, K-2, L-66
EqQ	B-164
InBi	S-116
KiB	S-117
KiL	B-165, B-219, B-220, C-90, K-2
KiP	C-89
SpVi	A-43, A-44, E-23, E-24, H-85, H-86
Sy	A-44, B-199, E-24, E-61, H-13, W-55
ThF	G-35, L-7
ThPh	C-26, H-13, L-66, W-55
ThSo	B-220

Acetic acid, potassium salt of

EcC	C-47, L-8
EqL	B-199
EqQ	B-164, H-18
MeV	C-47

Acetic acid, sodium salt of

EcP	K-91
EqI	E-59
EqL	B-199, B-219, B-225, K-52
EqQ	B-169, L-80
KiL	B-165, B-219, B-220
ThSo	B-220

Acetomesitylene

EqL	B-257
-----	-------

Acetone

EqH	H-138
EqL	B-177, B-199, B-225, B-236, B-237, B-247, F-16, H-12, H-14, H-15, I-19, K-52, S-48, W-71
EqQ	B-169, H-14, H-138
ElCl	K-88, K-89
InKi	A-34, H-138, R-44, S-133
KiH	F-26
KiL	H-15, R-43, R-44, R-45, R-52, W-9
KiP	H-89
SpEl	L-36
SpVi	B-79, E-23, E-24, G-40
Sy	R-45
ThD	L-17(s)
ThF	H-15
ThSo	C-32

Acetonitrile

EqL	R-48
KiL	R-47, R-48
SoH	P-59, T-56

Acetophenone

EqL	B-257
-----	-------

Acetoxime

EqL	E-63
-----	------

Acetylacetone

EqL	B-225, K-52, N-1
SoH	N-1

Acetyl chloride

EqQ	E-53
SpVi	F-24
Sy	E-24

Acetyl choline

Sy	E-45
----	------

Acetylene

AdG	K-56
EqG	G-12, G-32, H-120, R-55
EqH	G-11, H-120, R-53, R-54, R-55, R-56, R-58

Acetylene (Continued)

EqL	B-225
EqQ	B-99
KiG	G-12, J-42
KiH	C-60, F-28, G-11
KiP	J-45, M-53
KiR	L-75, L-76
SpEl	P-68, P-69
SpVi	B-196, B-197, C-99, G-30, G-31, G-32, H-95, H-96, H-97 M-12, M-106, M-107, M-108, N-13, R-7, S-150, S-165
Sy	B-197, E-27, H-96, J-36, J-45, K-58, L-76, S-150, W-59
ThF	C-66, G-32, R-56
ThPh	E-27

Acetylene dichloride

SpVi	T-92, T-93
Sy	T-93

Acetylene diiodide

Sy	E-27
ThPh	E-27

Aconitase

KiB	P-40
-----	------

Acrylic acid

EqL	B-236
-----	-------

Adipic acid

BiC	B-116
InBi	B-116
Sy	B-116
ThPh	B-116

Adrenaline

BiZ	C-63
Sy	C-63

Alanine

EqL	S-143
KiB	P-38

Albumen

EqL B-225

EqQ B-169

Alcohols

KiL J-41

Alizarin

EqH K-90

Allylphenol

InKi K-49

Allyl xylol ether

InKi K-49

Sy K-49

Alum, potassium

Cr S-17

Alum, potassium chrome

Cr S-17

SpEl J-35

Aluminum

EqH J-20

KiH J-20

MeDf G-77

Aluminum carbide

EqH B-65, J-20

Aluminum chloride

EqH K-31

KiH K-31

Aluminum hydride

SpEl C-52, G-19, G-61, H-131, H-132, O-26

SpVl H-131, H-133

Amino acids

Sy U-34, U-36

Aminobenzoic acid

EqL B-236, B-237, S-92, S-93

Aminocaproic acid

KiB P-38

Aminofluorene

EqL B-257

Ammonia

CrX V-9
EcC L-69
EID B-265
ElRf F-114, F-115
ElSc L-32
EqG F-7, G-12, W-65, W-66, W-67
EqH B-199, G-11, H-12, T-26
EqI L-69
EqL B-225, T-12
EqQ B-174, L-50
InKi T-25
KiG B-273, E-80, F-7, F-8, G-7, G-12
KiH G-11, J-44, M-83
KIP C-127, F-37, J-43, M-54, M-56, T-25
KiR J-40
MeD J-43, T-24
SpEl B-106, D-56, D-57, J-43, T-24
SpVi B-40, B-42, B-43, B-70, E-78, G-33, H-155, M-25, M-26, M-71, M-72, S-84, S-90, W-60
Sy A-48, B-265, F-114, K-43, K-46, W-31
ThF B-66
ThPh B-265, C-26, C-66, J-43, K-46, K-87, T-24

Ammonium bromide

ThPh C-86, S-106, S-109
Sy S-109

Ammonium chloride

CrX V-9
EqL A-27, B-236, O-3, O-5
MeD S-107, S-108
SpVi A-27

Ammonium chloride (Continued)

Sy A-27, N-18, S-107, S-108
ThF N-18
ThPh C-86, S-107, S-108

Ammonium ion

EqI S-49, S-51
EqL B-225

Ammonium nitrate

ThPh C-86

Ammonium phosphate, dihydrogen

CrX U-7

Ammonium salts

EqQ B-174

Ammonium sulfate

ThF N-19
ThPh C-86

Ammonium thiocyanate

ThPh C-86

Amyl alcohol

ElRo M-7
EqL H-124, I-19
SpVi H-124
ThPh H-124

Amylase

KiB C-3

Aniline

EqI S-49, S-51
EqL B-236, F-79, H-49, H-51, I-19
SpVi W-54
Sy B-122, W-54

Aniline hydrochloride

EqL H-52, K-72, K-73, K-74, O-21

Aniline hydrochloride (Continued)

InKi O-21

Kil K-74

Anisidine

EqH K-90,

Anisole

EqL I-13

Arginine

EqL S-143

InBi C-92

Argon

MeDf W-82

Arsenates

SpVi F-53

Arsenic acid

SpVi F-53

Arsine

SpVi D-16, H-80, L-38

Sy H-80, L-38

ThPh C-66, K-87

Ascorbic acid

EcC I-10

EqL I-10

Asparagine

EqL O-6

Aspartic acid

KiB P-37, P-39

Azomethane

KiG S-75

Barium chloride

EcC I-7

Barium chloride (Continued)

SoH A-48, E-3, L-18, T-18
ThPh E-3, B-96

Barium hydroxide

Sy M-33

Barium hypophosphite

EqI E-59
Sy E-59

Barium nitrate

EcC I-7

Benzaldehyde

EqL T-45
EqQ H-49, H-51
KiL F-102
Sy T-45

Benzaldehyde sodium hydrogen sulfite

EqL T-45
Sy T-45

Benzalmethoxybenzylamine

KiL S-4

Benzene

ElD I-15
ElMr D-59, F-57
ElRf B-201, E-48, I-15, M-111
ElRo E-52(s)
EqH H-139, H-145, H-146
EqL B-236, I-12, I-13, K-52, K-60, K-93, K-94, T-12, W-71
EqQ B-169, M-142
InKi H-146, H-147, H-152
InSt I-17
KiH C-60, E-12, F-22, F-45
Me B-195
MeD A-11, B-201, C-56, E-48, I-15, K-60, M-111
SpEl B-90, I-18, P-71, S-124, S-125
SpFl C-135, I-17, S-125, W-57
SpVi A-37, A-38, A-39, A-40, A-41, A-42, B-3, B-4, B-44, B-70,

Benzene (Continued)

- SpVi I-11, K-59, K-61, K-64, K-65, K-66, L-28, L-29, L-89,
L-91, M-142, R-28, R-33, R-34, R-35, R-37, S-123, W-90,
W-91
- Sy B-195, B-201, C-55, C-57, C-60, E-44, E-46, H-137, I-15,
K-59, K-60, L-27, M-111, R-34, R-35, R-37, W-35
- ThF L-90, Z-8
- ThPh A-11, B-201, E-44, E-48, G-69(s), I-15, K-60, M-111,
W-56, Z-8

Benzenesulfonic acid

- EqL I-13

Benzhydramine

- ElRo C-58, C-61
- Sy C-58

Benzhydramine hydrogen tartrate

- ElRo C-58
- Sy C-58

Benzhydramine oxalate

- ElRo C-58
- Sy C-58

Benzoic acid

- Cr R-94
- EcP R-116
- EqI E-29, R-116
- EqL B-236, H-49, H-51, I-19, K-2
- KiL K-2, K-4
- MeD R-95
- SoH E-29, E-47
- Sy E-46, E-47, E-48
- ThF E-29, R-116
- ThPh E-29, E-47, E-48

Benzoic acid, sodium salt of

- EcP R-116
- EqL B-199
- EqQ H-18

Benzophenone

- MeD A-11

Benzophenone (Continued)

Sy C-58

ThPh A-11

Benzophenone oxime

ThPh A-11

Benzoquinaldine

EqL K-37

Benzoyl peroxide

KlH E-58

Benzyl alcohol

EqL B-236, H-49, H-51, I-19, T-9

KlL F-102

Benzyl dimethylmethane

SpVi B-259

Sy B-259

Beryllium hydride

SpEl K-85

Beryllium hydride ion

SpEl C-52

Beryllium sulfate

SoH L-18

Biacetyl

EqL W-8

KlL W-8

Bicarbonate ion

EqI M-80

Bismuth

EqH G-53

Bismuth hydride

SpEl H-71, H-72

Bisulfate ion

EqI S-49

Boric acid

EqL O-5

Boron hydride

SpVi T-48

Bromate ion

EcC A-5

KiL A-6

Bromide ion

EqL A-7

KiL A-6

Bromine

EcC A-5

EqI A-5

EqL A-7

InKi R-44

KiG B-1, B-169, B-173, G-7

KiL R-41, R-43, R-45, R-52

SoH A-7

Bromodimethylaniline

EqL B-257

Bromoform

SpVi R-36

Sy R-36

Bromopalmitic acid

Sy H-109

ThPh H-109

Butane

EqG T-80

EqH F-12

KiG T-80

ThF T-80

Butene-1

KiH T-101

Butyl alcohol

KiH A-34

SoH T-57

Butylene

KiL F-30

Butyraldehyde

InKi A-34

Butyric acid

EqL I-58, I-59

SoH P-30, P-59, T-56

SpVi H-84

Sy S-33

Butyric acid, sodium salt of

Sy R-88

Cacodylic acid

EqI S-49

Cadmium hydride

SpVi D-14

Cadmium iodide

SoH E-3

Cadmium sulfate

SoH B-231

ThSo B-232

Calcium

EqH J-20

Calcium carbide

EqH J-20

Calcium hydride

SpEl G-19, G-72, G-73, O-26, W-27, W-28

Calcium hydroxide

EqL J-47, K-44

Calcium hydroxide (Continued)

Sy E-44

ThF K-44

Camphane

ElRo B-136, B-137, L-41

Sy L-41

ThPh L-41

Camphene hydrochloride

InKi N-10

Caproic acid, sodium salt of

Sy R-88

Carbohydrates

EqL H-44

EqQ H-44

Carbon

AdG K-56

KiH K-56

Carbon dioxide

EqH G-1

SoH C-128

Carbon disulfide

KiH F-45

Carbon hydride

SpEl F-2, F-3, G-13, G-14, G-17, G-18, G-19, G-20, S-70

SpVi G-18, W-100

Carbon hydrogen chloride

SpVi W-100

Carbonic acid

EqI C-129, C-130, M-80

Carbon monoxide

KiG M-51

Carbon tetrachloride

KiH F-45

SpVi E-16

ThPh F-1

Carboxylic acids

Eq I-55

Cellulose

AdL K-43

EqH C-30, C-31

EqL B-225

EqQ B-169

Cesium

SpA D-34

Cesium bromide

ThSo L-21

Cesium hydride

Sy H-4

ThPh B-188

Cesium phosphide

EqH B-65

Charcoal

AdG A-58, B-64, B-67, B-235, B-271, B-272, D-32, D-33, K-39,
K-40

EqH F-47

Chloral hydrate

Sy B-222

Chlorella

BiB C-108

KiP C-108, C-132, P-65

Chloride ion

EcC L-56

KiL A-6

Chlorine

EqG F-19
KiG F-39, G-7, R-103

Chloroacetate ion

KiL R-42

Chloroacetic acid

EcC L-69
EqI L-69, S-49
EqL B-236
EqQ M-132
Sy C-63

Chloroacetodihydroxybenzene

Sy C-63

Chlorodimethylaminonaphthalene

EqL B-258

Chloroform

ElRf B-222, T-91
EqL S-2
EqQ H-51
KiL H-148
MeD B-222, T-91
SpVi B-222, R-31, R-32, T-91, W-96
Sy B-222, R-32, T-91
ThPh B-222, T-91

Cholesterol

EqL R-87
Sy B-154, B-155

Cholesteryl chloride dibromide

EqL S-44

Choline

InBi S-86

Chromic chloride

EcC C-25
ThPh C-25

Chromic oxide

AdG B-91, B-93, K-68

Chromium complexes

ElCl D-54

Cobalt complexes

ElRo J-13

EqI E-35

EqL B-225, E-37, E-43, H-142, J-5, O-13, O-15

InKi B-18

KiL A-30, A-32, J-5

SpEl J-13

Cobaltous chloride

ElCl M-36

EqH P-9, P-10

ThPh B-95

Cobaltous sulfate

ElCl Z-3

ThPh B-96

Columbium

SoG S-181

Copper

AdG B-92, M-60, S-112

EcO H-141

EqH K-14

KiH H-119, J-36, W-40

MeDf G-76, G-77, M-61

Copper hydride

SpEl H-73, J-11

Coprostanone

InKi S-34, S-43

Coprosterol

InKi S-34, S-43

Crotonic acid

EqL I-58, I-59

Cupric chloride

ThPh B-96

Cupric complexes

EqL E-43

InKi B-18

Cupric oxide

AdG M-60

Cupric sulfate

CrX U-5

EcC I-7

ElCl B-94, B-248, Z-3, Z-4

EqH M-78

InKi M-63

KiH F-46, M-63

SoH L-18, M-76

Sy U-5

ThPh B-95, L-18, L-23, M-76, M-77, M-78, P-8, P-43, S-2
S-22

ThSo L-23

Cuprous chloride

EqH K-14, P-10

Cyclohexane

EqH F-27

EqL I-14, W-33

InKi H-152, H-153

KiH F-27

SpVi L-25

Cystine

EqL S-143

Diacetone alcohol

KiL B-216, H-151, N-8

Diacetyl

KiP H-89

Sy H-89

Dianisylphenylmethane

EqL K-37

Dibromobenzhydrylamine

ElRo C-62

Dibromoethane

SpVi H-83, M-88, M-108, M-142, R-28

Sy H-83, M-88

Dibromoethylene

SpVi T-94

Sy T-94

Dichloroethane

SpVi M-108

Didimethylaminonaphthalene

EqL B-258

Diethyl ketone

InKi A-34

Dihydroxybenzene

EqQ C-63, M-130

Dihydroxyxylene

EqQ M-130

Diisobutylene

KiL F-30

Dimethylamine

EqL G-36

Sy R-91

Dimethylaminofluorene

EqL B-257

Dimethylaminonaphthalene

EqL B-258

Dimethylaniline

EqL B-257, I-13, K-37

Dimethylglyoxime

EqH K-90

Dimethylindole

EqL K-70

Dimethylphenylmethane

ElRo B-274

Sy B-274

Dimethyl succinate

ElRf M-13

MeD M-13

Sy M-13

ThPh M-13

Dimethyl sulfone

KiL H-125

Dimethylsulfonic acid, sodium salt of

KiL H-125

Dinitrobenzene

ThPh C-26

Dioxane

ElD A-1(s)

EqL B-104(s)

EqQ A-1

KiL H-156(s), L-98

SpVi C-11(s), G-40(s)

ThF B-143

ThSo B-104(s), B-143, B-144(s), L-18(s), R-99(s)

Diphenyl

Sy E-58

Diphenylacetic acid

ElRo E-49

Sy E-49

Diphenylamine

EqL B-257

Diphenylaminomethane

ElRo A-11

ThPh A-11

Diphenyl ether

InKi K-49

Diphenylmethane

EqL K-37

Diphenylmethylethane

SpVi B-259

Sy B-259

Dithionic acid

KiL S-126

Dysprosium ethyl sulfate

ElCl R-108

EnzymesBiC F-82, F-92, F-93, F-98, H-158, J-3, J-4, M-8, M-9, P-36,
P-37, P-39, P-40, P-41

InBi F-88

KiB B-56, B-170, B-180, J-3, J-4, M-8, M-9

Ethane

AdG K-56

EqG S-136, T-80

EqH T-28

EqL T-57, T-12

EqQ F-34, M-99

InKi H-127, S-134

KiG M-95, M-100, S-131, S-136, T-80

KiH F-24, M-103

KiP S-134, S-136

MeD H-126

SpEl P-69

SpVi B-76, B-107, M-95, P-60, R-28, S-149, W-61

Sy H-125, H-127, M-95, M-103, M-105

ThF K-47, K-48, T-80

Ether

EqQ	H-49, H-51
KiG	D-12, M-84
SoO	E-35(s)
Sy	H-37
ThPh	E-36

Ethyl acetate

EqL	B-256, K-2
KiL	K-2, R-43

Ethyl acetoacetate

EqL	K-37
-----	------

Ethylacrylic acid

EqL	I-57
KiL	I-57

Ethyl alcohol

ElMr	D-59, F-57
EqH	H-138
EqL	B-236, B-256, B-257, B-258, J-47, K-2, K-37, O-34, R-40
EqQ	H-138
InKi	E-12, F-21, H-138, R-40
KiI	O-34
KiL	K-2, K-4, K-77, N-1, O-34, T-68
MeD	I-16
SpVi	B-189, H-16, M-85, M-86
Sy	C-32, E-56, I-16, K-37, S-4

Ethylamine

Sy	R-91
----	------

Ethylamine hydrochloride

EqQ	R-91
-----	------

Ethyl benzoate

EqL	K-2
KiL	K-2

Ethyl bromide

SpVi	E-66, H-83, L-26
Sy	H-83

Ethyl butyrate

EqL B-256

Ethyl citraconate

EqL B-256

Ethyl crotonate

EqL B-256

Ethyl cyclohexylacetate

EqL B-256

Ethyl diazoacetate

KiL G-65, G-66, R-43

Ethyl dimethyl acrylate

EqL B-256

Ethyl diphenyl acetate

EqL B-256

Ethylene

AdG K-56

EqG C-102

EqH H-145, H-146, K-55, M-105

EqI D-17, D-18

EqQ F-34

InKi H-146

KiG G-7, J-42, M-51, M-95, P-35

KiH F-24, J-36, K-53, K-55, K-56, M-105, T-98, T-102, W-40

KiL F-30

KiP J-46

MeAc R-63

SpEl P-68, P-69, P-70

SpVi B-111, B-112, B-113, C-101, C-102, D-19, G-3, H-81,
H-82, L-43, M-22, M-23, M-24, R-28, S-167, T-33, V-13,
W-100

Sy D-19, H-81, J-36, M-105,

Ethylene dibromide

Sy W-59

Ethylene dichloride

SpVi W-100

Ethylene glycol

EqL B-199, B-225

EqQ H-18

Ethyl formate

KiL B-215, B-216, N-8

Ethyl iodide

KiG J-42

Ethyl laurate

EqL B-256

Ethyl malonate

EqL B-256

Ethyl mercaptan

EqL H-124, I-19

SpVi H-124

ThPh H-124

Ethyl mesaconate

EqL B-256

Ethyl methoxy phenyl acetate

EqL B-256

Ethyl methoxy propionate

EqL B-256

Ethyl methyl malonate

EqL B-256

Ethyl orthoformate

EqL B-219

KiL B-217, B-219, H-151, R-43

ThF B-218

Ethyl phenyl acetate

EqL B-256

Ethyl phenyl ketone

ElRo C¹³106

Ethyl phenyl malonate

EqL B-256

Ethyl phenyl propionate

EqL B-256

Ethyl propionate

EqL B-256

Ethyl radical

EqG S-134

Ethyl sorbate

EqL B-256

Ethyl stearate

EqL B-256

Ethyl toluate

EqL B-256

Ethyl trimethyl benzoate

EqL B-256

Ethyl valerate (iso)

EqL B-256

Ferric oxide

AdG B-235

Ferrous sulfide

EqH J-20

Fluorene

EqL B-257, K-37

Fluorenol

EqL B-257

Formaldehyde

EqL B-225, B-236, K-52

EqQ B-169, W-77

InKi W-7

Formaldehyde (Continued)

KiL	F-102
SpVi	E-1, H-82, R-28
ThF	T-46

Formate ion

EqL	S-95
InSt	S-95
KiH	F-98

Formic acid

Ed	K-16
EqI	O-36, S-49, S-51
EqL	B-236
SpVi	B-186, H-84, H-88, H-128, S-101
Sy	B-186, H-88

Formic acid, potassium salt of

EqL	S-96
-----	------

Formic acid, sodium salt of

EqL	S-96
EqQ	H-26, M-132
KiB	F-36
Sy	W-55

Fructose

EqL	H-29, K-80, O-5, O-6
KiL	K-80

Fumarase

KiB	P-36, P-39
-----	------------

Fumaric acid

EcP	H-112
EqL	O-5
KiB	P-37, P-38, P-39
Sy	E-27
ThPh	E-27

Galactose

EqL	H-29, O-6
-----	-----------

Gallic acid, sodium salt of

EqQ	M-129
-----	-------

Gelatin

KiB B-250
MeDf M-115
SpVi E-15

Glass

AdG D-33, I-52, I-53

Glucofructose

EqL H-29

Glucose

BiC R-40
ElRo H-30, H-31, P-2, P-4, R-43
EqL B-225, H-29, K-80, O-6
EqQ B-169
KiL B-169, B-216, F-103, H-30, H-31, H-33, K-80, M-90, M-92,
P-2, P-3, P-4, R-40, R-43, W-102
ThF M-90, M-92

Glucosides

KiB B-180, S-5

Glutaconic acid

EqL E-77

Glutamic acid

EqH R-83
EqL O-6, R-23

Glutaric acid

EqL O-5

Glycerol

EqL K-80, O-6
ElRo E-31
KiL K-80
Sy E-31

Glycine

EqI S-49, S-51
EqL B-236, B-237, O-3, S-92, S-93
EqQ G-74, H-26

Glycolate ion

KiL R-42

Glycolic acid

KiL F-102

Glyoxal

KiL F-102

Sy E-27

ThPh E-27

Glyoxal phenylhydrazone

Sy E-27

ThPh E-27

Gold

EcO H-141

KiH H-119

Gold hydride

SpEl H-74, H-75, I-3, I-4

SpVi O-41

Hemocyanin

KiL S-168

MeDf S-168

Heptane

EqL I-14

Hexane

ElCl K-88(s), K-89(s)

EqH F-27

EqL I-14

KiH F-27

Histidine

EqL S-143

Histidine hydrochloride

EqQ H-26

Homocystine

Sy P-31

Hydrazine

KiP C-127

Hydrazine sulfate

EqL B-236, B-237, S-92, S-93

Hydrides

EqH H-5

SpEl G-15, G-16, H-164, H-165, P-33

Sy H-5

Hydriodic acid

EcC A-5

EqG M-136, U-28

EqH R-89, R-90

KiG B-146, G-7

KiL C-32, C-37

KiP C-103

SpVi B-80

Sy R-90

ThF B-85, B-146, M-136, U-28

ThPh B-80, C-66, K-87, S-154

Hydrobromic acid

ElSc L-33

EqG M-136, W-67, W-68

SpVi B-81

Sy J-36, W-59

ThF B-85, M-136

ThPh B-81, C-66, K-87, S-154

Hydrocarbons

An M-96

KiH F-11, F-42

Hydrochloric acid

EcC B-13, F-67, I-7, L-56, L-88, T-89

EcO H-114

EcP L-5, N-26, R-116

ElD B-102

ElRf F-115, T-88

ElSc L-33

EqG B-225, C-126, G-64, M-136, S-139, U-28, W-67, W-68

EqH K-14, K-91, P-9, P-10

Hydrochloric acid (Continued)

EqL	I-13, K-44, K-60, K-91, L-5, L-12, L-66, R-116, W-71
InKi	H-152, N-16
KiG	B-84, G-7, G-64, S-139
KiL	B-220, G-4, K-4, O-36
KiP	L-42
MeD	T-88, T-89
SpEl	C-52, N-29, N-30
SpVi	H-54, W-45, W-46
Sy	B-102, L-27, S-139, T-88
ThF	B-84, K-44, K-91, M-136, N-26, R-116, U-28
ThPh	C-26, C-66, K-87, L-64, S-154
ThSo	B-220

Hydrocinnamic acid

ElRo	E-42
Sy	E-41

Hydrocyanic acid

SpVi	A-13, B-77, B-78, C-110, H-70
ThPh	C-26, C-66, L-67

Hydrofluoric acid

KiG	L-86
ThPh	C-26, C-53, C-66, F-110

Hydrogen

AdG	B-64, B-67, B-91, B-92, B-93, B-157, B-190, B-271, B-272, D-32, D-33, E-11, G-28, H-156, I-1, I-36, K-5, K-54, K-55, K-56, K-62, K-68, L-48, M-16, M-20, M-21, M-42, M-60, M-61, M-105, P-1, P-58, S-97, S-112, S-158, S-159, T-20, T-44, U-2, W-39
Cr	T-69
EcC	B-108, L-56, S-77, S-79, U-2
EcO	C-6, C-8, H-110, H-111, H-112, H-113, H-141, H-144, N-33, V-1
EcP	A-4, A-8, H-24, H-27, H-112, H-136, N-26, S-50, S-51, U-28
El	B-225
ElD	B-100, B-249, I-49, K-24, K-25, K-26, M-48
ElGd	G-70, G-79, G-80, G-81, J-25, J-26, L-39, P-26, R-65, S-138
ElMg	R-5, R-6, S-79, W-79, W-80
ElRf	F-111, O-32, O-33

Hydrogen (Continued)

ElSc	L-31, L-32
EqG	A-8, A-48, B-225, B-271, B-272, C-67, C-122, C-126, F-7, F-19, G-12, G-51, G-53, G-64, H-22, I-29, J-24, J-32, J-48, M-136, P-12, R-81, R-90, S-136, S-139, T-27, T-70, T-80, U-3, U-28, W-65, W-66, W-67, W-68
EqH	A-8, B-145, B-169, B-199, B-225, B-276, C-26, C-27, C-119, C-120, C-121, C-122, F-6, F-12, F-13, F-16, F-17, F-18, F-27, F-40, F-47, F-76, G-11, G-50, H-138, H-139, H-146, I-29, J-32, K-14, K-55, K-91, O-7, O-14, O-23, L-71, M-105, P-9, P-10, R-89, R-90, S-74, T-19, T-20, T-26, T-28, T-70, T-73, T-100, U-3, W-37, W-38
EqI	H-27, S-50
EqL	C-20
EqQ	B-179, F-34, H-18, H-22, H-138, M-99, R-91
Ki	P-56
KiG	A-22, B-1, B-84, B-98, B-169, B-173, B-273, C-82, D-4, E-79, F-7, F-8, F-19, F-20, F-31, F-32, F-33, F-39, F-41, F-43, F-48, F-120, G-7, G-12, G-46, G-64, H-116, H-118, H-121, J-32, K-18, K-41, L-48, M-51, M-52, M-84, M-95, M-100, P-32, P-41, P-55, R-103, S-104, S-130, S-131, S-136, S-139, S-157, T-80
KiH	A-34, B-86, B-191, C-6, C-7, C-8, E-11, E-12, E-58, F-4, F-11, F-9, F-21, F-22, F-24, F-26, F-27, F-28, F-29, F-42, F-45, F-46, G-10, G-11, G-12, H-117, H-118, H-119, H-143, I-31, J-32, J-36, J-37, K-53, K-55, K-56, M-53, M-83, M-101, M-102, M-103, M-105, O-14, P-58, S-97, T-20, T-96, T-97, T-98, T-100, T-102, U-8, W-40
KiI	O-16
KiL	A-2
KiP	F-37, J-45, L-42, M-51, M-53, M-58, M-97, M-98, M-104, S-100, S-136
KiR	L-77, M-134
Me	B-225
MeAc	E-72, I-37, I-42, I-43, I-50, I-51, I-54, R-63
MeD	B-69, C-66, C-105, M-45, M-46, M-68, S-23, S-24, S-25, T-69, U-1
MeDf	C-118, D-35, E-72, F-13, F-68, F-69, F-100, F-101, G-76, G-77, G-81, H-70, I-41, J-37, J-38, J-39, L-84, M-38, M-61, S-164
MeSt	D-32, H-53, I-34
MeV	A-21, A-23, B-12, B-234, H-25, I-38, I-39, I-44, I-45, I-46, I-47, I-48, T-75, V-2, V-4, W-40
So	B-225

Hydrogen (Continued)

SoG	S-77, S-78, S-80, S-81, S-82, S-83
Sp	S-119, U-21
SpEl	B-125, B-127, B-128, B-129, C-52, D-25, D-26, D-27, D-28, D-30, D-31, E-22, F-84, F-85, F-86, F-87, F-120, F-125, G-161, H-69, J-6, J-9, J-10, K-32, M-47, O-25, S-19, T-77, W-29, W-92, W-95
SpVi	A-36, A-62, B-131, B-132, B-133, E-22, E-70, E-78, H-162, M-70, S-7, S-8, T-34, V-5, W-43
SpX	F-118
Sy	B-126, F-47, H-118, K-63, N-28
Th	B-225
ThD	A-23, A-56, A-57, B-166, B-167, F-105, K-11, K-12, K-50, N-32, S-28
ThF	B-75, B-84, B-85, B-101, B-138, B-159, C-66, C-67, C-68, C-70, C-71, C-72, C-73, C-75, C-76, C-77, C-78, C-88, C-98, E-70, F-71, H-123, I-49, I-51, I-54, J-24, J-48, K-91, L-45, M-58, M-69, M-118, M-136, N-26, S-26, S-54, S-157, T-69, T-80, U-21, U-28, V-3, W-37
ThPh	B-69, B-226, B-227, B-228, B-229, C-26, C-64, C-65, C-69, C-70, C-73, C-74, C-77, C-97, C-98, E-70, L-57, L-58, L-59, L-72, M-4, M-49, S-26, S-27, S-53, S-54, S-55, S-140

Hydrogen halides

KiH	E-76
-----	------

Hydrogen ion

EcC	B-109, C-10, W-14
EcP	A-4
EQI	A-3, A-4, D-53, E-28, G-35, G-63, H-27, K-44, K-91, M-80, S-49, S-50, T-74, W-105
EqL	A-8
KiI	B-172, B-178, H-150, M-90
MeDf	W-82
SpVi	L-18
ThF	K-91, O-36

Hydrogen peroxide

EqL	A-9, A-10, E-36, F-50
EqQ	W-77
KiH	G-24, O-24
KiL	C-32, C-37

Hydrogen peroxide (Continued)

MeD	F-52
SpVi	F-50, F-51
Sy	F-50, F-52
ThF	G-24

Hydrogen selenide

CrX	V-8, V-10
ElRf	F-116
ElSc	L-32
MeD	K-105
SpVi	C-9
Sy	K-104
ThPh	C-66, K-87, K-102, K-104, K-105

Hydrogen sulfide

CrX	V-8, V-10
ElRf	F-111
ElSc	L-33
EqG	G-53, J-32
EqH	G-53, S-94
EqL	G-8, T-9
InKi	T-9
KiG	J-32
MeD	K-105
SpVi	B-5, B-6, M-140, M-141, N-14, N-15
Sy	K-104, N-14
ThPh	C-66, K-87, K-103, K-104, K-105

Hydroquinone

EqI	R-116, S-49
EqL	B-236, B-237, B-244, R-116
EqQ	H-26, M-130
SoH	K-91
ThF	K-91, R-116

Hydroxybenzaldehyde

SpVi	M-27
------	------

Hydroxyl

SpEl	C-22, C-23, I-21, I-22, I-23, I-24, I-25, I-26, J-15, J-21, J-22, N-6, O-40, R-19, R-20, R-21, S-9, S-10, S-11, S-12, S-13, S-14, S-15, S-16, S-65
------	--

Hydroxyl (Continued)

SpVi B-275, C-51, E-66, O-40, P-72

Hydroxylamine

EqL O-5

Hydroxylamine hydrochloride

EqL O-3

Hydroxyl ammonium chloride

Sy R-29

Hydroxyl ammonium ion

SpVi R-29

Hydroxyl ion

EcC B-109, W-14

EcP A-4

EqI A-3, A-4, D-53, E-28, K-44, K-91, O-7, T-74, W-105

EqL A-8

KiL O-34

KiL A-2, M-33, R-42

ThF K-91

Hypophosphites

KiH F-98

Hypophosphorous acid

EqI E-59

Indene

EID C-18

EqL K-71

SpVi M-28

Indole

EqL K-71, K-78

KiL K-78

Inulin

EqL O-6

Iodate

KiL A-6

Iodide

EqL	A-7, A-9, A-10
KiL	A-6

Iodine

EqG	A-48
EqH	R-89, R-90
KiG	G-7
KiH	G-10
SoH	A-7
ThPh	C-33

Iron

AdG	B-157, K-55, K-56
EqH	J-20, T-26
KiH	H-119, K-53, K-55, K-56
MeDf	G-77, G-81
SoG	S-83

Ketoglutaric acid

EqH	R-83
-----	------

Krypton hydrate

ThPh	G-34
------	------

Lactose

EqL	O-6
-----	-----

Lauric acid

Sy	H-109
ThPh	H-109

Lead

EcO	H-141
-----	-------

Lead sulfate

EqL	S-67
-----	------

Leucine

EqL	S-44
InBi	R-24

Lithium

EqH	J-20, W-37
ThF	W-37

Lithium bromide

ThSo B-143

Lithium chloride

EcC C-47

MeV C-47

SoH L-18

ThSo B-143, L-21

Lithium fluoride

SoH L-18

Lithium hydride

CrX T-90, Z-9

ElCl K-15

EqH T-90, W-37, W-38

MeD T-90, W-37

SpEl C-52, C-111, C-112, C-113, C-114, C-115, C-116

ThF K-15, W-37

ThPh T-90

Lysine

EqL S-143

Sy W-33

Magnesia

AdG I-30

Magnesium

EqH J-20

MeDf M-38

Magnesium hydride

SpEl F-122

SpVi G-82

Magnesium sulfate

ThPh B-95

Maleic acid

EcP H-112

EqH R-83

EqL O-5

EqQ M-132

Malic acid

EqL O-5

KiB P-37, P-38, P-39

Malico dehydrogenase

BiC J-2

Malonic acid

EqQ H-26, M-132

SpVi E-4

Sy B-200, E-61, H-13, W-55

ThPh H-13

Maltose

EqL O-6

Mandelic acid

ElRo E-50

Sy E-50

Manganese

EqH J-20

Manganese chloride

ThPh M-126

Manganese sulfate

SoH E-2

Mannite

SoH N-1

Mannitol

EqL H-29

Mannose

EqL H-29, K-80

Menthol

ElRo O-8

Mercuric chloride

EcC I-10

Mercuric chloride (Continued)

EqL I-10
SoH E-3

Mercuric cyanide

ThSo L-18, L-21

Mercury

EcO H-110, H-111, H-113, H-114, H-141, N-33
EqG T-27
KiH H-119
KiP J-43, J-45, J-46, M-54, M-58, M-59, M-97, M-98, S-134

Mercury dimethyl

KiP S-100

Mercury hydride

SpEl F-124, G-61, O-25
SpVi H-134, M-120, M-121, M-122, M-123, M-124

Mesocystine

EqL S-143

Methane

AdG B-64
EqG C-102
ElRf F-112
ElSc L-32
EqG G-12, S-136, T-27, T-80
EqH H-12
EqQ M-99
KiG G-7, G-12, G-46, M-95, M-100, S-130, S-136, T-80
KiH M-101, M-102
KiL C-90
KiP F-37, M-97, M-98, M-104, S-136
MeD K-105
MeDf I-41
MeV B-221, I-35
SpEl N-17
SpVi B-39, B-107, C-42, C-43, D-2, D-21, G-29, M-14, M-15, M-95, R-28, W-60
Sy B-200, C-43, F-112, M-15, M-95, S-137, U-27, W-31
ThF B-74, C-66, C-88, C-91, F-96, T-80
ThPh C-66, C-87, C-88, C-91, F-96, F-97, K-105, S-137

Methionine

InBi S-86
Sy P-31

Methoxybenzalbenzylamine

KiL S-4

Methoxyfluorene

EqL B-257

Methoxynaphthalene

EqL K-37

Methyl acetate

EqL B-219
KiL B-216, B-219, H-151, N-8, R-43

Methylacetylacetone

EqL N-1
KiL N-1

Methylacridane

EqL B-258

Methyl alcohol

ElRo O-8
EqI G-41
EqL G-8, H-17, N-1, O-12, O-13, O-17
KiL G-4
MeD R-48
SpVi B-38, B-76, B-79, G-39, G-41, M-87, N-23, P-72, R-31, R-32
Sy N-23, O-12, R-32
ThF H-17

Methylamine

EqL G-36
EqQ R-91
SpEl F-77, F-78
SpVi E-5, E-18
Sy E-18, F-78
ThPh E-18

Methylbenzylamine

ElRo Y-6

Methyl bromide

SpVi N-22

Sy N-22

Methylcarbazole

EqL B-258

Methyl chloride

EqQ H-49

SpVi N-16, N-22

Sy N-22

Methylcyclohexane

EqL I-14

Methyldiphenylamine

EqL B-258

Methyl ether

InKi S-133

Methyl ethyl ketone

InKi A-34

Methyl galactoside

EqL H-25

Methyl glucoside

EqL H-29

Methylindole

EqL K-70, K-75

KiL K-75

Methyl mannoside

EqL H-29

Methyl oleate

KiH B-86

Methyl radical

EqG S-134

Methyl tartrate

ElRo B-266

Molybdenum dioxide

AdG H-157

EqH T-70

Naphthalene

Sy C-57

Neodymium oxalate

KiH F-46

Neodymium sulfate

ElCl F-59, K-1

Nickel

AdG I-1, I-36, K-54, K-55, L-48, M-16, M-105

EcO H-141

KiH F-4, F-29, H-119, T-98, T-102

MeDf G-77

SoG S-80

Nickel chloride

KiH F-46

ThPh B-95

Nickel sulfate

ElCl Z-3

ThPh B-96

Nicotine

SoH B-266

ThPh H-21

Nitramide

EqL L-11

KiH G-58

KiL L-10, L-81

Nitric acid

EcC I-7, T-89

Nitric acid (Continued)

ElRf	R-30, T-88
MeD	R-30, T-88, T-89
SpVi	B-17, R-30
Sy	B-17, T-88

Nitric oxide

KiG	F-43, H-116
-----	-------------

Nitrobenzene

SoH	V-14
Sy	C-55

Nitrodimethylaminonaphthalene

EqL	B-258
-----	-------

Nitrodimethylaniline

EqL	B-257
-----	-------

Nitroethane

ElCl	M-32
EqL	M-35
KiL	M-34, M-35
ThF	M-35

Nitrogen hydride

SpEl	D-29
------	------

Nitroisopropane

KiL	M-35
ThF	M-35

Nitromethane

EqL	I-19, R-41
KiL	R-41, W-102
SpVi	W-63
Sy	R-41, W-63

Nitroparaffins

KiL	M-33
-----	------

Nitrophenol

EqL	K-79, K-81, K-83, M-37
KiL	K-79, K-83

Nitrotoluene

EqL K-37

Nitrous oxide

KiG M-51

KiP M-51, M-53

Octanol

ElRo Y-5

Sy Y-5

Olefins

EqH T-100

KiH T-100

Orcin

EqQ M-130

Ornithine

InBi C-92

Sy C-92

Oxalic acid

Cr R-93, R-94

EqI S-49

EqL O-5

KiL L-98, S-45

MeD R-95

Sy R-94, S-45

ThPh B-96, R-93

Oxalic acid, sodium salt of

EqL O-5

Oxygen

AdG K-5

EqH G-1

EqQ H-22

KiG C-82, F-41, F-120, H-118, K-18, K-41, M-51, P-32, S-157

KiH H-117, H-118, T-96, T-97

KiP M-53

KiR L-77

ThF F-71

Palladium

AdG	G-28, M-61, S-159, U-2
Cr	U-2
EcC	S-77, S-79, U-2
ElMg	S-79
EqH	R-83
KiH	F-29, J-37, T-96, T-97
MeDf	F-13, F-100, F-101, G-77, H-61, J-37, J-38, L-84
SoG	S-77, S-78, S-82

Palladous tetrammine

KiL	A-29
-----	------

Palmitic acid

EqL	R-87, S-44
-----	------------

Paraldehyde

SpVi	W-94
Sy	H-109
ThPh	H-109

Penicillin

EqQ	O-2
-----	-----

Pentaerythritol

CrX	U-5
Sy	U-5

Pentane

ElRf	W-42
InKi	H-152, H-153
SpVi	R-11, R-12, W-42
Sy	W-42
ThPh	W-42

Perbromate

EqL	A-7
-----	-----

Perchlorate

EqL	A-7
-----	-----

Perchloric acid

EcC	F-67
-----	------

Perchloric acid (Continued)

EqL O-5
SpVi F-80
Sy F-80

Phenol

EqL B-236, H-49, H-51, I-13, I-19, K-69, K-82, S-96
KiL K-69, K-82
MeD P-29
SoH N-1, P-53, T-56
SpVi W-54
Sy B-122, K-49, W-54
ThPh H-21

Phenylaminobutyric acid

KiB V-18

Phenylbenzaldehyde

EqL T-45
Sy T-45

Phenyl butyl ketone

KiL H-156

Phenyl carbazole

EqL B-258

Phenyldimethylmethane

SpVi B-259
Sy B-259

Phenyltolyl

Sy I-60

Phenyltolylacetic acid

ElRo I-60
KiL I-60

Phloroglucinol

EqQ M-129

Phosphatase

KiB P-36

Phosphine

KiG	G-7
KiP	M-58, M-59
SpVi	H-79, H-80, L-38, S-166
Sy	H-79, H-80, L-38
ThF	B-66, M-58
ThPh	C-66, K-87

Phosphonium iodide

Sy	H-80
----	------

Phosphoric acid

EqI	R-116, S-49, S-51
EqL	O-5
KiL	F-30
SpVi	S-87, W-45, W-46
Sy	F-30, S-87

Phosphorus

KiG	K-41
-----	------

Phosphorus hydride

SpEl	I-27, I-28, P-34
------	------------------

Phthalic acid

Cr	R-94
MeD	R-95
Sy	R-94

Picoline

SoH	P-59, T-57
-----	------------

Picric acid

EqI	S-49
ThPh	G-69

Platinous tetrammine

KiL	A-29
-----	------

Platinum

AdG	K-5, M-20, M-21, M-42, T-44
EcO	H-141
EcP	H-136
EqH	F-18, H-139, R-83

Platinum (Continued)

InKi	H-136
KiH	E-12, F-9, F-21, F-22, F-26, F-28, F-29, H-119, H-143 M-53, M-83, O-24
MeDf	D-35, G-77, J-39

Potassium

EqH	J-20
-----	------

Potassium bromate

EcC	R-107
ThSo	L-21

Potassium bromide

EqL	K-44
SoH	E-3
ThF	K-44
ThSo	L-21, L-22

Potassium carbonate

SpVi	P-53
------	------

Potassium chlorate

EcC	R-107
-----	-------

Potassium chloride

EcC	B-13, F-113, I-7, L-8, L-14, L-56, L-88, R-104, R-105, T-89
ElD	D-36
EqL	M-78
MeD	R-104, T-89
MeV	R-104, R-105
SoH	L-18, M-78, S-66
ThF	L-15
ThPh	N-20, N-21, R-98
ThSo	L-21, L-22, R-98

Potassium cyanide

ThSo	L-21
------	------

Potassium fluoride

ThPh	B-96
ThSo	L-21

Potassium fluoride, acid

CrX	U-5
SpVi	K-35, K-36
Sy	U-5

Potassium hydride

SpEl	I-5
Sy	H-4, S-113
ThD	S-113
ThPh	S-113

Potassium hydroxide

EqL	K-44
ThF	K-44

Potassium hypophosphite

EqL	B-199
EqQ	H-18

Potassium iodate

EcC	R-107
-----	-------

Potassium iodide

SoH	E-3
SpEl	D-49
ThSo	L-21, L-22

Potassium ion

EcC	L-56
-----	------

Potassium nitrate

EcC	I-7
-----	-----

Potassium permanganate

KiL	C-32
-----	------

Potassium phosphate, dihydrogen

CrX	U-4, U-5, U-6, U-7
ElD	B-19, Q-1, Z-19
EqI	E-35
EqL	B-225
Sy	B-19, U-5, U-6
ThF	B-19

Potassium phosphate, hydrogen

EcP R-116

EqL H-28

SpVi S-87

Sy S-87

Potassium sulfate

EcC I-7

EqL S-67, H-28

SpVi H-78

Praseodymium sulfate

ElCl K-1

Propane

EqG T-80

EqH F-12, M-105

EqQ M-99

InKi S-135

KiG M-95, M-100, T-80

KiH M-105

Sy M-105

ThF T-80

Propionic acid

InKi H-127

SpVi H-87

Sy H-127

Propyl alcohol

KiH A-34, F-26

Propylene

EqH M-105

KiG M-95

KiH M-105

KiL F-30

Protein

SpVi E-15

Pyrogallol

EqL B-236

Pyrogallol (Continued)

EqQ M-129
KiL G-6

Pyrrole

ElD C-19
EqL H-49, H-51, I-19, K-76
SpEl M-74
SpVi B-182, M-79, R-34
Sy M-79, R-34

Pyruvic acid

EqL G-9

Quartz

EqH F-18

Quinaldine

EqL B-257, K-37

Quinhydrone

EcP H-27, K-91, L-5, L-12, R-116
EqI H-27, L-12, L-13
EqL K-91, L-5, L-12

Quinoline

KiH C-7

Quinone

KiH C-7
SoH K-91, L-18

Resorcinol

Cr R-94
EqL H-28
EqQ M-130
KiL G-6
MeD R-95
Sy R-94

Rubidium bromide

ThSo L-21

Rubidium hydride

Sy H-4
ThPh B-188

Salicin

KiB S-129

Salicylaldehyde

SpVi B-183, B-184
Sy B-183, B-184

Salicylic acid

EqI K-91, S-49
KiL B-215

Salicylic acid, sodium salt of

EcP K-91

Silane

ThPh S-153, S-154

Silica gel

AdG K-39

Silicobromoform

SpVi D-16

Silicochloroform

SpVi D-16

Silicoethane

ThPh S-153, S-154

Silicon dioxide

AdG B-235

Silicon hydride

SpEl R-100
SpVi R-100

Silver

EcO H-141

Silver (Continued)

KiH H-119

MeDf G-77

Silver chloride

KiH I-31

Silver hydride

SpEl K-84

Silver nitrate

ThSo L-21

Silver permanganate

SoH H-76, L-18

Sodium

EqH J-20

KiH E-76, G-7

Sodium bromide

SoH E-3

ThPh E-3, B-95

Sodium carbonate

SpVi P-53

Sodium carbonate, acid

Cr R-94

MeD R-95

Sy R-94

Sodium chloride

EcC C-47, F-113, L-88, T-89

KiL B-220

MeD T-89

MeV C-47

SoH A-48, C-10, C-32, C-36, E-3, L-18, T-18

SpEl D-50

ThF G-35

ThPh C-10, R-98

ThSo B-220, L-20, L-21, L-22, R-98

Sodium chromate

ThPh M-126

Sodium hydride

SpEl O-26, O-27, O-28

Sy H-4, S-114

ThF S-114

ThPh S-114

Sodium hydroxide

EcC R-106

EqH J-20, K-91

EqL B-236, B-237, H-28, O-5, S-67

KiL H-156, W-9

SpVi P-53

Sy B-222, H-80

ThF K-91

Sodium hypophosphite

Sy F-98

Sodium iodide

SoH E-3

ThPh E-3

Sodium nitrate

ThSo L-21

Sodium perchlorate

ThSo L-21

Sodium phosphate, dihydrogen

EcP R-116

Sodium selenate

ThPh M-126

Sodium sulfate

EqL S-67

MeDf O-35

SoH E-3

ThPh B-95, E-3, E-35, E-36, H-115, T-15

Sodium sulfate, acid

CrX U-5

Sy U-5

Sodium thiosulfate

ThPh M-126

Stannic oxide

EqH I-29

Starch

BiC F-93

EqL O-6

KiB C-3

Stearic acid

SpVi C-93

Sy S-36

Strontium chloride

CrX U-5

EqL M-78

SoH M-76

Sy A-27, U-5

ThPh B-95, M-76, M-78

Strontium hydride

SpEl W-30

Styrene

EqL B-257

InKi Y-3

KiL K-77, T-68

Suberic acid

BiC B-116

InBi B-116

Sy B-116

ThPh B-116

Succinic acid

BiC B-116

Succinic acid (Continued)

Cr	R-94
CrX	U-5
ElRo	L-40
EqH	R-83
EqL	B-236, B-237, B-244, H-28, O-5
EqQ	H-26, M-132
InBi	B-116
KiB	E-60
MeD	M-13, R-95
Sy	B-116, H-13, L-40, M-13, R-94, U-5
ThPh	B-116, H-13, M-13

Succinic acid, sodium salt of

EqI	E-59
EqL	O-5

Succinic anhydride

MeD	M-13
Sy	M-13
ThPh	M-13

Succinimide

EqL	K-37
-----	------

Sucrose

BiC	R-40
ElRo	G-67
EqL	G-67, K-80, O-3
EqQ	B-169, B-174
KiB	S-128
KiL	B-169, G-67, G-68, H-32, H-33, H-50, M-90, M-91, R-40
ThF	M-90

Sulfuric acid

EcC	I-7
EqH	J-20
EqL	B-236, B-237, I-13, I-14, O-5, S-44, S-67
KiH	J-20
MeDf	O-35
SpVi	L-37, W-45, W-46
Sy	F-52, L-37, M-33

Tartaric acid

ElRo	O-8
Sy	E-27, H-2
ThPh	E-27

Tartaric acid esters

Sy	E-27
ThPh	E-27

Tartaric acid, potassium sodium salt of

ElD	H-2, H-129, H-130
ElMg	H-2
MeD	H-130

Tartaric acid, sodium ammonium salt of

ElRo	E-26
------	------

Tetrachloroethane

Me	B-223
SpVi	T-92, T-93
Sy	B-223, T-93
ThPh	B-223

Tetramethylglucose

EqL	H-29
KiL	H-33

Tetrasilane

ThPh	S-154, S-155
------	--------------

Thiazole

InSt	E-64
------	------

Thiophene

ElRf	S-142
MeD	S-142
Sy	S-142
ThPh	S-142

Tin

EcO	H-141
EqH	I-29

Toluidine

EqH K-90

Toluidine hydrochloride

EqL O-22

InKi O-22

Trichlorophenol

EqL S-96

Triethylamine

SoH P-59, T-56

Trifluoroacetic acid

Ed K-16

Trihydroxybenzene

EqQ M-129

Trihydroxybenzoic acid, sodium salt of

EqQ M-129

Trimethylamine

EqI S-49, S-51

Trimethylamine hydrochloride

EqQ R-91

Trinitrobenzene

EqL K-37

Triphenylamine

EqL B-258

Triphenylmethane

EqL B-257, K-37

SpVi B-259

Sy B-259, H-13

ThPh H-13

Trisilane

ThPh S-154, S-155

Tritium

EqH B-145

Tungsten

AdG B-190, E-11

KiH E-11, E-13, J-44

Tyrosine

EqL S-143

Urea

CrX U-4, U-5

EqL B-236, B-237, H-28, O-3, O-5, S-92, S-93

EqQ H-26

KiB B-210, B-211

KiL O-6

SpVi O-41

Sy U-5

Vinylacetic acid

EqL I-56, I-58, I-59

InKi I-56

KiL I-56

Vitamin B₁

EqQ H-26

Water

AdG A-58, B-235, I-30, I-52, I-53, K-39, K-40

AdL K-43

CrX M-44, S-147, V-9

EcC B-109, F-90

EcO B-194, H-111, H-112, H-126

EcP B-230, B-231, B-232, F-81, M-128

El A-48, B-225

ElCl B-94

ElD A-1, B-142, D-36, D-37, G-71, L-65, M-127, T-1, T-50, W-101

ElGd T-103

ElMg C-1, C-2, F-117, G-54, H-122, I-32, N-7, O-20, S-59, S-120, T-81, T-82

ElMr D-60, G-2, H-6, O-19, S-89

ElRf B-87, B-88, C-13, C-26, C-133, C-134, L-60, L-103, M-39, O-19, S-59, S-152, T-29, T-52, W-21

Water (Continued)

ElRo	O-20
ElSc	B-130, B-135, C-12, L-32
EqH	A-8, B-65, B-145, F-17, H-140, I-2
EqI	A-4, D-53, E-28, K-44, T-74, W-105
EqL	A-3, A-8, B-104, F-50, O-36, R-17, R-55, T-73
KiB	A-35, B-54, B-56, B-250, C-3
KiG	D-4, E-79
KiH	S-127
KiL	B-178, H-15, W-73
KiP	M-56, P-67
Me	A-46, A-48, B-140, B-225
MeAc	B-2, I-37, I-40, Y-2
MeD	B-68, B-134, B-135, C-26, C-32, C-34, C-35, C-48, C-81, C-134, H-151, I-6, I-59, J-19, J-28, K-3, L-62, L-78, L-87, L-94, L-103, M-75, M-117, R-115, S-32, S-59, S-120, S-156, S-170, S-171, T-2, T-12, T-29, T-55, T-87, W-21, W-74, W-75, W-101, Y-2
MeDf	I-41, M-115, O-35, O-37, T-40
MeSt	B-105, C-94, F-72, I-6, J-28, L-1, L-2, S-59, T-1, T-4, T-53, T-86
MeV	B-13, C-10, J-27, L-44, L-63, L-94, S-59, T-29
So	B-225, T-1
SpEl	F-101, O-1, S-32
SpVi	A-12, A-24, A-25, A-26, B-41, B-71, B-72, B-82, B-185, C-11, C-12, C-13, C-15, C-29, C-125, E-17, E-66, E-78, F-40, F-127, G-40, G-42, G-43, G-44, G-45, H-98, H-99, K-22, K-42, L-71, N-31, P-53, R-13, R-14, R-15, R-16, R-17, R-18, R-22, S-69, S-91, S-111, V-6, W-46, W-83, W-84, W-85, W-86, W-87, W-88, W-89
SpX	M-43
Th	B-140, B-225
ThD	B-233, L-17, M-67
ThF	B-110, B-143, C-95, D-38, F-56, F-71, H-15, J-48, K-44, L-15, L-85, R-112, W-36, W-103
ThPh	B-73, B-233, B-253, B-254, C-26, C-66, D-13, D-22, D-38, E-73, E-74, H-115, J-1, L-6, L-9, L-18, L-47, L-55, L-62, L-85, M-75, R-14, R-38, R-69, R-70, R-74, R-75, R-112, S-99, S-127, S-137, S-152, T-5, T-6, T-7, T-29, T-51, T-54, T-55, T-58, T-73, U-17, W-3, W-21
ThSo	B-104, B-143, B-144, C-44, D-38, D-39, L-18, L-73, M-48

Xenon hydrate

ThPh G-34

Xylenol

Sy K-49

Zinc

EqH J-20

Zinc hydride

SpEl F-123

Zinc oxide

AdG S-97

KiH S-97

Zinc sulfate

ThPh B-96

